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Teaching Color Strategies

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Thesis Definition

Color communicates to us. Color surrounds us. We are constantly aware of it. Color is a powerful tool and an important part of our visual experience. It is an element of design that most people will instantly recognize in a communication. As designers, the color choices we make must go beyond our own preferences, mere visual appeal, or the fact that certain colors were successful in a previous project. Color can help or hinder the transmission of a message and understanding it is a vital part of developing successful graphic design communications. For many designers color can become intuitive, but how does one get to that stage?

It is not typically a degree requirement for graphic design students to take a separate color course as it is for fine art, architecture, photography and interior design students. Color theory and strategies are usually taught to graphic design students in a foundations class – foundations courses could have a fine art base or graphic design base. A professor might use Josef Albers' exercises to introduce students to color interactions. At the conclusion of the exercises, a professor might show fine art examples to compare color applications. Also included in the lesson might be a list of color theory terminology including primary, secondary, tertiary, complementary, monochromatic, simultaneous contrast...and the list goes on. In addition to memorizing terminology, painting a color wheel is usually required.

This method of teaching color is very helpful and has been used for many years and has its merits. Are there more effective ways to teach color strategy to graphic design students of the 21st century? Can students be equipped with specific principles and rationale for making appropriate and effective color decisions in their applied graphic design problems?

Mission Statement

To improve graphic design education through the addition of an effective series of instructional exercises for teaching color strategies.

What is this Thesis?

The *Color Strategy Project* is an instructional tool developed as a set of structured short exercises revealing the rudiments of color as they pertain to graphic design. The Color Strategy Project is not a color course, nor does it attempt to teach everything about color theory. Its purpose is to get students working actively in a meaningful exploration in order to become more aware of color and make thoughtful decisions when using color. This tool will act as an introduction to color strategies for graphic design students.

Goals and Objectives of the Color Strategy Project

- students will better understand color interactions through the exercises
- students will be able to recognize how intelligent use of color can affect a graphic communication
- students will build a working color vocabulary
- students will discover how specific color combinations can better communicate specific messages
- students will be able to identify how color can be used to achieve specific outcomes (contrast, dimension, temperature, atmosphere, etc)
- students will be able to apply their understanding of color to more complex problems whether they are 2- or 3-dimensional, for print or web, static or in motion
- students will learn the importance of proximity, quantity, proportion and placement
- students will understand what impact color choices have on meaning, function and form

Precedents

These precedents herein represent a sample of existing projects, case studies, models and people that have meaningful relationships to this thesis.

Rob Roy Kelly (1925-2004)
www.rit.edu/~rkelly/htm
December 5, 2003

Rob Roy Kelly was a pioneer of graphic design education. He said that "learning is not an automatic consequence of teaching. Effective teaching entails identifying what students gain by doing problems, and using content, process and criteria directed toward learning."
One of his mentors Josef Albers, (refer to page 8 of the Precedents section) was a tremendous inspiration to Kelly as a teacher.

When Kelly talks about teaching color, he explains "teaching of color has been limited to taking one hour a week from basic design. To do this, I restricted myself to about four or five exercises, color interaction, boundaries, visual mixture and how much to how much. Most students coming into design education are not visually sensitive, and I found the color problems the best vehicle for students developing a discriminating eye for color choice and amount, composition and better understanding of what constitutes visual sensitivity which could then be transferred to other courses such as drawing, design, typography and photography. Sensitivity itself cannot be taught, but students can be made aware of it, and they can cultivate their intuitive capabilities. What is described here is not so much a color course as it is a series of problems to make students sensitive to color and composition, and to further develop eye skills. Graphic Design students require a much more comprehensive course in color."

Significance

The ideas and writings of Rob Roy Kelly had an impact on this thesis because his teaching and educational philosophies are an inspiration. He believed in the importance of teaching graphic design students strong color skills.

Howard Gardner

For over thirty years Howard Gardner, Professor of Cognition and Education at the Harvard Graduate School of Education, has made substantial contributions to art education. His theory of Multiple Intelligences suggests that we all acquire knowledge and learn and understand differently.

Significance

Howard Gardner's theory of Multiple Intelligences has had an influence on this thesis because his theory suggests that people all learn differently. When developing successful lesson plans such as the Color Strategy Project, it is important to be aware of how people all have their own way of learning and to accommodate different kinds of learners.

Performance-based Education

Performance-based education challenges educators to design lessons that are task-oriented. It suggests that students need to learn through relevant tasks (making a connection to their lives) that focus on students' ability to use their knowledge and skills in meaningful ways.

Significance

Performance-based education suggests that students need to learn through relevant tasks–a concept that will be an integral part of the Color Strategy Project. For this project, students will use a computer and graphic communication which may be a more relevant means of exploring color variables than colored paper or paint.

Programmed Instruction	Method of presenting new subject matter to students in a structured sequence of controlled steps. Students work individually through programmed material at their own speed, and after each step test their comprehension by answering questions or completing a diagram.
Significance	A method of teaching that gives structure but allows enough freedom for independent student exploration.This will be one of the aims of the Color Strategy Project.
Constructivist Teaching	In the late 1970s there was a transition in education from the behaviorist model, which did not value students' prior knowledge, to a constructivist approach. Constructivism is a cognitive approach which allows students to not only build on existing knowledge, but to constantly call upon and use prior knowledge. The constructivist philosophy has limitations and cannot be used exclusively in the visual arts because true creativity and experimentation must not be overlooked.
Significance	The notion of building on existing knowledge and to call upon seems to be a very basic idea about learning. One of the goals of the Color Strategy Project is for students to use the color strategies they learn in future applications, projects and classes.
Technology and Education	Technology has changed the world of professional practice and has influenced the curriculum for students who wish to enter the design field. Computer technology also affects fine art and photography where students explore non-traditional methods of working.
Significance	Some suggest that technology is artificial, while working with paint or paper is more real. Whether this is true is not the focus here but rather that in general, graphic designers use the computer as their main tool. The world around us is changing and technology does have its place in design education. One of the goals of the Color Strategy Project is to use the computer as an vehicle for effectively exploring color strategies.
Article From *Academe* *January–February 1999*	*Educating: The Academy's Greatest Failure Or It's Most Important Future?* by Linda Darling-Hammond, was an eye-opener to the educational process as a whole. Darling-Hammond talks about the responsibilities of universities to better prepare individuals who become teachers. She suggests that better prepared teachers will "stimulate higher levels of academic achievement." She asserts "...teaching in universities has been presumed to be an intuitive act. Professors who know a great deal about a subject and their graduate students who teach many courses are assumed magically to understand how to make what they know accessible to others. On most college campuses, preparing teachers has been a low status, under-resourced activity." (Darling-Hammond, p 28)
Significance	This article serves as a reminder of the importance of knowing and understanding teaching philosophies and principles, and to furthermore, apply them in lesson design.

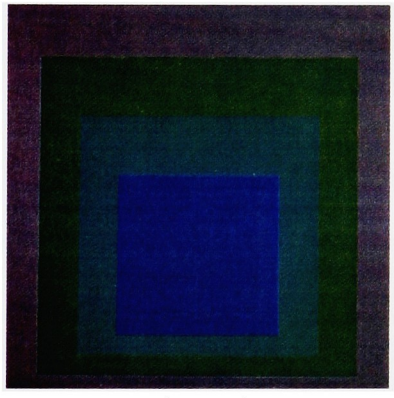
Josef Albers (1888–1976)
www.yale.edu
www.bauhaus.de/english
April 10, 2004

The Bauhaus in Germany has been described as the most important school of architecture, design, and art of the 20th century. Josef Albers was at the Bauhaus in Germany from 1920 until 1932. He was first a student and then a teacher. Albers was there longer than any other person in the history of this pioneering school of art.

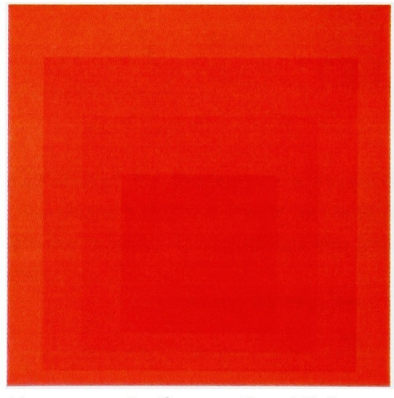
In 1933 Albers came to the United States. He taught and lectured at numerous colleges and universities. He served as head of the Design Department at Yale University during the 1950s.

For 25 years, Josef Albers used the same format of squares within squares for his experiments with the optical effects of specific color combinations, called *Homage to the Square*. His book, *Interaction of Color*, is an experimental approach to the study and teaching of color. It includes exercises in seeing color, an explanation of the characteristics of color, and the conditions under which certain optical phenomena occur.

Albers was the first living artist to have a major solo retrospective at the Metropolitan Museum of Art in New York. His art has been presented in exhibitions and permanent museum collections all over the world.



Homage to the Square: Star Blue



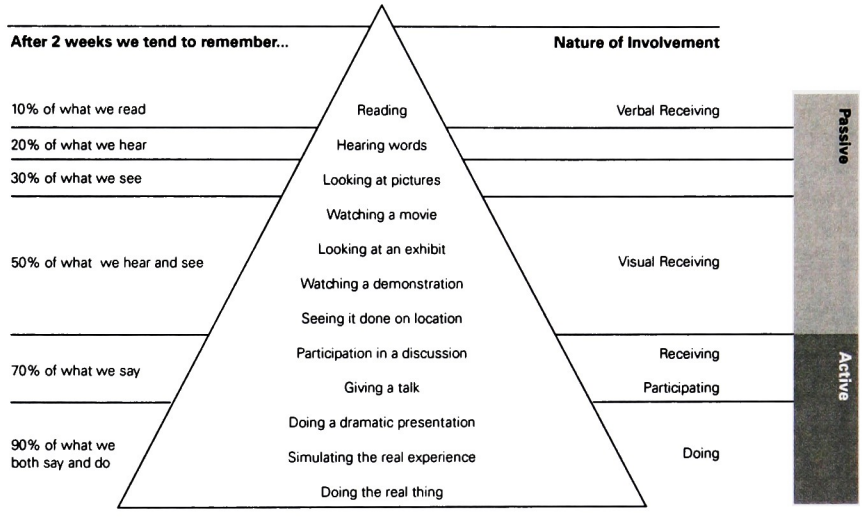
Homage to the Square: Board Call

Significance

Josef Albers is considered one of the great master teachers on the use of color. A comprehensive study on teaching color would not be complete without considering the teaching philosophies of Albers – especially his approach of "practice before theory." Refer to page 85 of the appendices section.

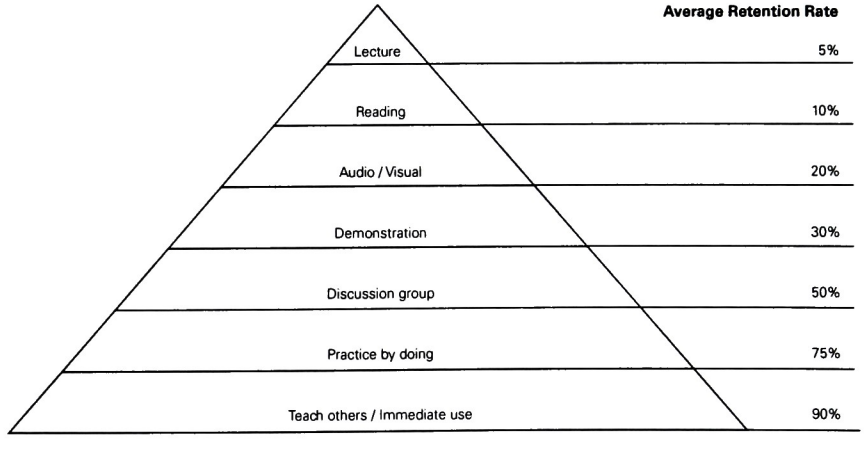
Cone of Learning
Edgar Dale, Audio-Visual Methods in Technology, Holt, Rinehart and Winston

Educator Edgar Dale, developed the *Cone of Learning* over many years. It shows a spectrum from passive to active involvement and suggests how we best retain information. In general the activities that are more active and participatory help us to better remember what we learn and we learn best from direct hands-on experiences.



The Learning Pyramid
National Training Laboratories Institute for Applied Behavioral Science Alexandria, VA

The National Training Laboratories in Bethel, Maine developed *The Learning Pyramid*, which shows a similar structure to the Cone of Learning. The diagram shows average retention rates for different teaching methods. The highest retention rate is found through discussion groups, practice by doing, teaching others, and immediate use.



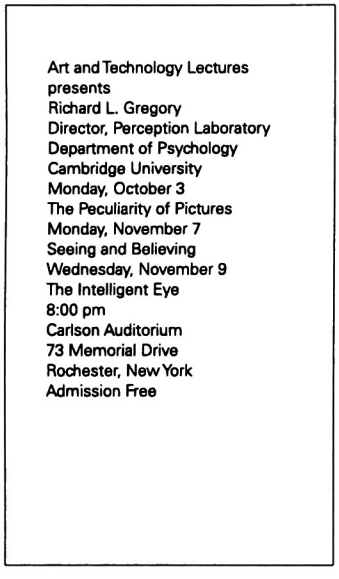
Significance

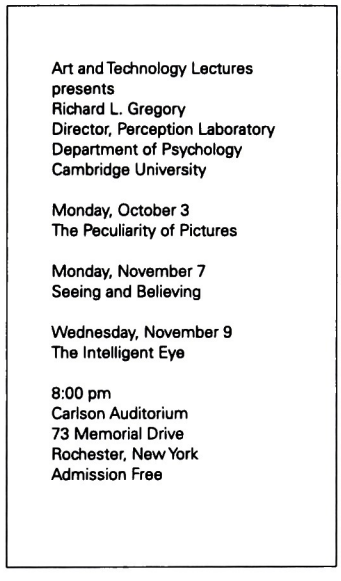
The Cone of Learning and Learning Pyramid suggest we learn best and retain information through active participation, practice by doing and immediate use, for example. One of the goals of the Color Strategy Project is to incorporate these ideologies into the lesson.

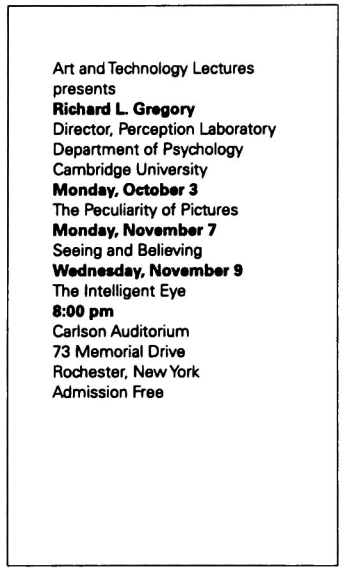
Karen Moyer

Karen Moyer, Associate Professor in the Department of Design at Carnegie Mellon University in Pittsburgh, developed the *Typographic Hierarchy Project* in 1979. This series of structured short exercises helps students use typographic variables, eventually understanding how they affect the transmission of a message.

This example shows how individual typographic variables can be isolated in a sequence of exercises to explore the potential of a single variable.







Significance

The *Typographic Hierarchy Project* is significant in that it serves as a model for the way the Color Strategy Project should be structured and work.

Johannes Itten (1888–1967)
www.cs.umb.edu
April 10, 2004

Before joining the Bauhaus, Johannes Itten headed his own art school in Vienna. At the Bauhaus he designed an innovative introductory course: he had students explore form, color, rhythm and contrast. Itten's revolutionary way of approaching color theory not only looked at the psychics of color, but also recognized the psychological effects of color. Itten examined color theory from two different approaches, from the subjective and the objective. A longstanding conflict with Walter Gropius led Itten to resign from the Bauhaus in 1923. Moholy-Nagy replaced him.

Significance

For many years Itten studied, taught and wrote about color. His introductory course on color was innovative and his books and ideas on color are studied by many and for these reasons, he is important to include in this thesis.

The pedagogical research for this thesis includes fundamental teaching principles and philosophies. The research focused on teaching strategies, learning theories and in-depth lesson plan design. This research was a vital part in developing and forming the instructional tool, the Color Strategy Project.

Learning Styles Theory
Illuminating the New Standards with Learning Style: Striking a Perfect Match. Clearing House, May/June, Vol. 73 Issue 5.

Attending to Learning Styles in Mathematics and Science Classrooms, ERIC Clearing House Columbus, OH 1997.

Learning styles theory emphasizes that we process information differently and our brains don't all work the same way. It implies that individuals learn based on how the information is presented and if it is geared toward their particular style of learning. Learning styles focuses on students' strengths as opposed to their weaknesses and all students have particular strengths when it comes to learning. Students don't learn the same way so it is important to incorporate learning style theories into lesson design so students have the opportunity to learn through their own strengths. "Attending to learning styles helps teachers adjust instructional strategies to foster increased learning among individuals, and it helps students take more responsibility for the conditions of their own learning." (Thomson, p 34) Learning styles are not fixed throughout one's life, but develop as a person grows. Learning styles theory focuses on the content and products rather than on the process as with the theory of Multiple Intelligences.
Refer to page 6 of the Precedents section.

There are three basic modes by which students learn: visual learning, auditory learning and kinesthetic learning. Although most students do not learn exclusively in one mode, they learn best through one of them. Incorporating learning styles into the classroom does not make teaching easier and usually means more work for the educators. What learning styles will do for every classroom is make learning more effective, more enjoyable and aid in the learning process for the students. Incorporating learning styles into lessons will create a sense of variety for the student and will assure that educators are taking a fresh approach towards their instruction. When educators take a multi-learning styles approach in the classrooms it ensures that higher order thinking skills will be met by all students no matter what their learning style might be. Educators provide opportunity for all students to learn by allowing students the opportunity to take advantage of their own specific learning style. Teachers also foster a more relaxed learning environment when students are allowed to learn in a way that focuses on their strengths instead of weaknesses and eliminates tension and failure on both the part of the student and educator. When students feel comfortable in their environment, because they are learning in the most effective way for them, student participation and achievement is maximized.

Visual learners need to see it to believe it. The visual learner excels with lessons that allow them to express their ideas by writing and drawing with paper and pen. Specific strategies educators can implement for visual learners include: use of actual examples, charts, graphs, film/video, handouts, books and note taking.

Auditory learners need to hear it to remember it. They are comfortable when they are expressing themselves orally. They learn best by hearing verbal instructions from others or themselves. Oral examinations are one of the most effective assessments for auditory learners.
Specific strategies educators can implement for visual learners include: use of tapes, lectures, repeat directions, critique, discussion and oral review.

Kinesthetic learners need to touch it to remember it. They need to be active participants in the learning environment. Kinesthetic learners learn best by activity or direct involvement. Specific strategies educators can implement for kinesthetic learners include: role playing, demonstrations, sense of touch, modeling, hands-on experience and debate.

What Is a Rubric?
Teaching Strategies: A Guide to Better Instruction. Houghton Mifflin Co; 6th edition 2001.

In all walks of life people are evaluated. Why should education be any different? One of the main goals educators strive for is to effectively teach all students so they can learn and understand what they were taught and use the information in the future. There are many different ways to assess students' progress but one popular way it to use a rubric. A rubric is an objective assessment. It is a scoring tool that lists the criteria and objectives of a project. Each criteria and objective may be listed on the left and scoring system may be on the right with varying degrees of quality, from excellent to failure. (A rubric structure was used for this thesis in the evaluation packet that was sent out. Refer to page 113 appendices section) "A rubric offers a means of evaluating a students' work by comparing that student's efforts with an appropriate model of excellence. Rubrics usually illustrate superior, average, and unacceptable models of performance. The student examines these models and then monitors and evaluates both his or her own work and of their classmates" (Orlich, p 355)

Understanding by Design
Prentice Hall; 1st edition, 2000.

In *Understanding by Design*, Chapters 5 and 6, one of the topics the authors discussed was the idea of thinking like an assessor. The authors stated that in order to think like an assessor there are two basic questions a teacher must ask: "Where should I look to find hallmarks of understanding and what should I look for in determining and distinguishing degrees of understanding?" (Wiggins and McTigue, p 67) Since no two students are alike and student abilities varies from one to another, how do we universally look to find hallmarks of understanding in students? In order to understand this question, one must treat each student's understanding separately. Significant learning and understanding for one student, might be little or no understanding of the same material for another student, based on student's abilities.

"Understanding develops slowly and reveals itself as a progression along a continuum for any single idea; our assessments must better reflect this fact." (Wiggins and McTigue, p 89) In developing rubrics how do we develop one rubric to evaluate all students based on the same criteria? We need to ask our students to repeat and relate main ideas on subject matter over time and we need to see some sort of progression with regards to the students and the main ideas of content being covered. With student abilities varying greatly our assessments need to not only reflect recurring themes and ideas, but also reflect each student's own progression in regard to the material and their own ability.

In Chapter 7 of *Understanding by Design* the authors discuss their notion of *uncoverage*. Uncoverage is how teachers examine and discover the material we want students to learn. Teachers cannot simply cover material, but must take time to examine how material is presented. Uncoverage is essential and enables teachers to dissect and present big idea questions to their students. Students can then uncover the meaning and obtain a deeper understanding.

Lesson Plan
Zemelman. Best Practice. Heinemann; 2nd edition, 1998.

A lesson plan is a sequential guide that serves as a framework to accomplish instructional goals and objectives. Clear lesson plans are essential especially for those who are new in the teaching profession. There are many different models for lesson plan design but they have similar and fundamental components. Refer to page 22 of the synthesis section.

Goals and Objectives
Measurement and Assessment in Teaching. Prentice Hall, 2000.

One of the most crucial elements of one's job as an educator is to clearly define instructional goals and objectives. There must be observable and measurable outcomes for each lesson in order to ensure student success. At the beginning of each planning process, teachers must ask themselves, "What should students be able to do at the end of the course that they could not do at the beginning?" (Linn and Grolund, p 64). This will help educators define specific objectives. Goal-setting is the single most critical element in establishing a clear direction for learning.

Communication
Educational Psychology: Windows on Learning. Merrill Prentice Hall, 2001.

Teachers need to be able to effectively communicate. There are four aspects of effective communication in the learning environment. Effective communication happens when teachers use clear and precise language. Teachers need to eliminate vague language from their speech in order for students to completely understand what they are saying. This in turn, minimalizes confusion. Teachers have to make topic relationships clear when teaching their lessons. The points of a lesson need to be very clear to students, especially as information relates to other topics. Another important aspect of effective teacher communication is the use of transition signals with students. In other words, they need to sequence information effectively and have the topics flow into one another. Transition signals are spoken statements that indicate to students that one topic is ending and another is beginning. The effective use of transition signals allow students time to adjust and prepare themselves mentally for the new topic. The final aspect of effective classroom communication is emphasizing important information with students. Effective teachers emphasize important information in a lesson to students by drawing attention to the information with the use of spoken clues. Teachers can also emphasize important information by repeating it several times. Effective communication begins with the teachers monitoring what they say to students when teaching their lessons to ensure their presentations are clear and logical to students. Teachers must understand all aspects of the content they teach to students to ensure that the transformation of knowledge is clear and understood properly by students.

Teacher / Student Focus
Educational Psychology: Windows on Learning. Merrill Prentice Hall, 2001.

The use of introductory focus by teachers towards students attracts student interest to the information being presented and provides a framework for the lesson being taught and can develop an effective learning environment. Another form of teacher/student focus is sensory focus where the teacher uses visuals such as pictures, objects, models and demonstrations to maintain student attention on the material being presented.

Provide Feedback
Educational Psychology: Windows on Learning. Merrill Prentice Hall, 2001.

Feedback provides students with a sense of value about their knowledge of the information being taught and how accurate their knowledge is on the topic. Two forms of teacher/student feedback are praise and written feedback. Teachers should praise students' responses to information being presented based on the accuracy of those responses. Praise should always be perceived by students as being sincere. Written feedback is where teachers use notes and comments on students' projects or homework to let them know how they are doing and how well they understand the information being taught.

Questioning
Marzano, Pickering, Pollock. Classroom Instruction that Works. ASCD, 2001.

Questioning is one of the most effective means educators can use for guiding students in constructing proper understanding of the information. An effective teacher can use questioning to assess students' prior knowledge on a subject. This helps students form relationships with the information being taught. Their are four basic points to consider when teachers use questioning:

- Frequency is the number of questions a teacher asks students during a lesson.
- Equitable distribution describes the way in which teachers call on students in their classroom and that all students are called upon equally in the course of a lesson.
- Teacher prompting refers to teachers encouraging students to respond correctly to something after an incorrect response has been offered.
- Wait time is the brief silence both before and and after a student responds to a teachers' question. This is a valuable aspect of effective teacher questioning because it gives the student time to think (10 seconds is the general rule).

Use Review and Closure
Marzano, Pickering, Pollock. Classroom Instruction that Works. ASCD, 2001.

Review summarizes what students have learned and helps students make a connection to the new information which is coming. Closure is a kind of review used at the end of a lesson to check students' understanding of the material presented.

The color and design research includes general color theory, color theory taught to art students, current methods of teaching color to graphic design students, color strategies and color psychology and basic design principles.

Certain aspects of color research and theory is information that has been available for many years – in some cases, hundreds of years. Therefore the references for the color section are listed below in a general listing. Some research highlights specific ideas, theories and quotes and therefore the specific reference is cited in those areas.

Color References

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Color, Contrast and Dimension in News Design. www.poynterextra.org, February 2, 2004.

Color Theorists

Color theory has basically remained unchanged and remains the basis for research and development of color. A tremendous amount of research continues on the study of color for advances in color for artistic, graphic and scientific applications.

The appendices of this document, pp 88–93, contain in-depth information of people who have studied color and their work since the 1700s. Although there were many others before (and after) this time who had great influences on the study of color, the 1700s were chosen as a starting point with Sir Isaac Newton, who is well known for his work with color. This thesis is not about teaching color theory, but it was imperative that different color theories be explored to help determine what color strategies should be included into the Color Strategy Project.

Complexity of Color

It has been said that "Color is the most complex fundamental element of design." (Design Dynamics p 124) It is true that color is an extremely complex subject and any study on it must include areas of four major sciences as they apply to color: Physics a study of radiation and illumination; Chemistry a study of pigmentation; Physiology a study of the human eye; and Psychology a study of the mind. (Grumbacher p 1)

Teaching Color Theory

It is not typically a degree requirement for graphic design students to take a separate color course as it is for fine art, architecture, photography and interior design students. Color theory and strategies are usually taught to graphic design students in a foundations class. The curriculums of several colleges and universities were investigated in order to find out the schools that do require a separate course on color for the degree. Refer to page 19 of the Research section.

Color Terminology

One may read three different books on color theory. In each of those books, three different words may be used when referring to the same thing. For example, intensity, saturation and chroma virtually mean the same thing. As a student studying color, color terminology can be very confusing. Refer to page 80–83 of the glossary of terms section.

Using Color

This thesis is about practical use of color. "Being familiar with the sources of color and its principle properties is of little value unless we understand how to use these facts." (Bone p 156) Josef Albers believed in "practice before theory" and for this reason his ideologies on teaching color were closely investigated. Albers began by teaching his students how to carefully look at colors.

Color Wheel

The color wheel for the triadic pigment mixing system includes primary, secondary and tertiary hues. It is the opinion of this designer that the color wheel is still the easiest way to understand color relationships. Sir Isaac Newton was the first one to conceive of color as a wheel. Refer to pages 41–43 of the ideation section.

Color Systems

An objective way of identifying color would be using systems such as those developed by Munsell and Ostwald and the Pantone color system. These, and others like these, are useful to the designer in that they provide a means in which one can identify and describe colors. They also provide a wide range of hues and provide a consistent means of manipulating color. However, these color systems don't teach students how to properly use and apply color.

Different Mediums and Color

The same basic principles of color theory apply to all design, however color on the web is very different than color for offset printing. Learning about color variables through different mediums is something that must be learned after students learn the basics of color.

Additive and Subtractive Color

Understanding the distinction between light and pigment when referring to color has been especially important since the 1990s. Graphic designers use computers and computer monitors use the additive color model whereas printing uses the subtractive color model. Additive color is color that is created by superimposing light rays. Adding the three physical primaries – red, green and blue – will produce white light. The secondaries are magenta, yellow and cyan. Subtractive color is the sensation of color that is produced when wavelengths of light are reflected back to the viewer after all other wavelengths have been subtracted and/or absorbed. (Bone, pp 321–325)

Uses of Color
Bone, pp 156–167

Color can be used in the following ways:

1 To give spatial quality to the pictorial field.
- Color can supplement, or even substitute for, value differences to give plastic quality.
- Color can create interest through the counterbalance of backward and forward movement in pictorial space.

2 To create mood and symbolize ideas.
3 To serve as a vehicle for expressing personal emotions and feelings.
4 To attract and direct attention as a means of giving organize to to a composition.
5 To accomplish aesthetic appeal by a system of well-ordered color relationships.
6 to identify objects by describing the superficial facts of their appearance.

Color Psychology
www.pantone.com
October 12, 2003

"Color is a magical element that gives feeling and emotion to art and design." (Bourges p 5)
It is our personal and cultural associations that affect our experience with color. Colors are seen as warm or cool almost universally due to the associations we have with them. For example, yellow, orange and red are associated with the sun and fire and are considered warm colors. Blue, green and violet are associated with the sea and sky and are considered cool colors. Warm colors will appear to advance and expand and cool colors appear to recede and contract. Using warm colors for foreground and cool colors for background enhances the perception of depth. Although red, yellow and orange are generally considered high-arousal colors and blue, green and most violets are low-arousal colors, the brilliance, darkness and lightness of a color can alter the psychological message. Colors act upon the body as well as the mind. Red has been shown to stimulate the senses and raise blood pressure, while blue has the opposite effect and calms the mind.
Refer to pages 92–94 of the appendices section.

Timeline of Color Theorists

Bone, Robert; Clayton, David; Ocvirk, Otto; Stinson, Robert; Wigg, Philip. Art Fundamentals, Theory & Practice. WCB/McGraw-Hill; 7th edition, 1994. pp 151–154

Zelanski, Paul. Fisher; Mary Pat. Color. Prentice Hall, 2nd edition, Englewood Cliffs, NJ 1994. pp 46–56

1700	Isaac Newton	New Theory of Light and Color
1766	Moses Harris	The Color Circle
1800	J.W. von Goethe	Color Triangle, Theory of Colors
1810	Philipp Otto Runge	The Color Sphere
1870	Michel Eugene Chevreul	Basics in Color Theory, The Principles of Color
1880	Nicholas Odgen Rood	Optical Mixing
1905	Albert Henry Munsell	Color Tree, Atlas of The Munsell Color System
1910	Wilhelm Ostwald	The Color Solid, The Ostwald Color Album
1963	Joseph Albers	Interaction of Color
1973	Johannes Itten	Color Star, The Art of Color

Refer to pages 88–93 of the appendices section

Josef Albers Color Theory

Albers. Interaction of Color. New Haven, CT: Yale University Press, 1987. pp 2–6, 69

Practice before theory

No color system by itself can develop a sensitivity for color

Systematic study done with colored papers

Students experiment with different color combinations

Exploring color through a systematic study

- Promotes thinking in situations
- The exercises are not meant to illustrate, decorate or beautify something, but aim at the development of the ability to produce the desired color effects
- Step-by-step learning promotes recognition of insight coming from experience and evaluation resulting from comparison

Advantages of working with colored paper

- Mixing paints is difficult and time consuming.
- Failure to mix paints correctly can be discouraging to students.
- With paper, students will gain a continued active interest.
- Permits repeated use of precisely the same color.
- Eliminates tools and equipment for handling paints, and therefore is easier, cheaper, and more orderly.
- Eliminates the undesired and unnecessary addition of texture from brush marks/strokes, incalculable changes from wet to dry, loose or heavy covering, hard or soft boundaries, etc.

Sensebox
January 19, 2004

Sensebox.com was used as a comprehensive guide to locate visual communications programs, specifically to focus the research on what the program requirements are for color courses.

Require a Color Course

Carnegie Mellon, College of Fine Arts
BFA Communication Design
Color and Communication

Catalog Description, 2004

As a communication tool, color can signal, enhance, and speak in ways that type and images cannot. Combined with type and images, color can contribute to the persuasive and communicative force of design. Beginning with a perceptual understanding of color, this course will explore the many ways that color communicates. Students will work with traditional materials and tools as well as computers to understand the strengths and limitations of each, comparing their similarities and differences in the context of theoretical and applied projects.

Northeastern University
BS in Graphic Design
Visual Foundations: Color (Studio)

Catalog Description, 2004

Students in this course explore the objective nature and expressive possibilities of color. Through classwork and projects, students examine the major theories and laws of color, its harmonies and special characteristics, as well as color psychology, symbolism, and orchestration. Students discover their intuition for color and develop its application in art and design.

Rhode Island School of Design
BFA Graphic Design
Color

Catalog Description, 2004

A series of experiences devoted to the development of the perception of color and its use as a tool for the graphic designer. The exercises test the appearance of color relationships in complex structure by applying gouache paint and mixing and matching colors. Junior level requirement.

State University of NY College at Buffalo
BFA Communication Design
Color Theory
No Description available

Don't Require a Color Course

State University of NY College at Fredonia
BFA Visual Arts, New Media, Graphic Design

Maryland Institute College of Art
BFA Graphic Design, Digital Arts

Parsons School of Design
BFA Communication Design

Pratt Institute
BFA Communication Design

Rochester Institute of Technology
BFA Graphic Design

School of Visual Arts
BFA Graphic Design

State University New York at Buffalo
BFA Communication Design

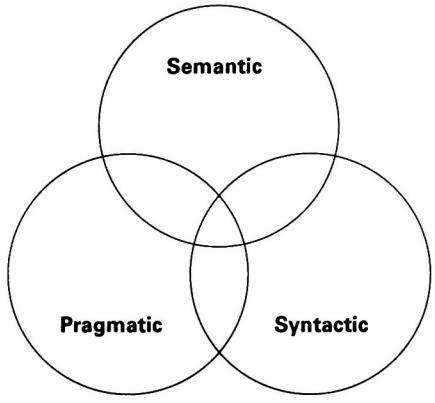
State University New York at Purchase
BFA Graphic Design

Syracuse University
BFA Communication Design

Virginia Commonwealth University
BFA Communication Design

Semiotic Dimensions
Rochester Institute of Technology, School of Design, 2003

The semiotic model represents the three dimensions of anything designed: meaning, form, manufacture/use. It can be a very useful evaluation tool to isolate each of the three dimensions to determine how well a design solution satisfies the appropriate goals of the dimensions. This structure also acts as an outline for designers to simplify and organize complex problems/ideas. This model will act as an evaluation mechanism for the Color Strategy Project.



Semantic
concept, meaning

Meaning
concept
content
context
hierarchy
message
symbols
words

Perception
balance
emotion
gestalt

Communication
accuracy
clarity
appropriateness
integrity
language
readability

Syntactic
formal, aesthetic

Form
composition
hierarchy
proportions
typography

Structure
grid system
margins
rhythm
white space

Variables
position
size, shape
texture, tone
weight, color

Pragmatic
technical, functional

Ergonomics
accessibility
environment
human factors
legibility
lighting, visibility

Production
fabrication
materials, tools
processes

Specification
cost, deadlines
schedule

Distribution
interactive
mailed, posted
static, kinetic
time-based

Synthesis

Rochester Institute of Technology, School of Design, 2003

The synthesis reveals interrelationships and patterns between information by successfully sorting, sequencing, ordering information or parts of the problem. To help ideate potential solutions for this thesis, several problem solving tools were used: brainstorming, mind mapping, comparative matrix and "Wurman's Organizing Hatricks". In Richard Saul Wurman's book *Information Anxiety* there are five ways to organize information. By organizing and reorganizing the same set of facts new conclusions or interpretations can result. These conclusions may in turn influence the way in which a design problem is approached.

Qualities of Useful Objectives
Mager. Preparing Instructional Objectives. Lake Pub. Co., 1984. pp 45–48

Words open to many interpretations ↓	Words open to fewer interpretations ↓
to know	to write
to understand	to recite
to really understand	to identify
to appreciate	to sort
to fully appreciate	to solve
to grasp the significance of	to construct
to enjoy	to build
to believe	to compare
to have faith in	to contrast
to internalize	to smile

To help determine learning objectives, consider the following:

1 Performance
What should the learner be able to do?
An objective always states what a learner is expected to be able to do and /or produce to be considered competent.

2 Conditions
Under what conditions do you want the learner to be able to do it?
An objective describes the important conditions (if any) under which the performance is to occur.

3 Criterion
How well must it be done?
An objective describes the criteria of acceptable performance; that is, it says how well someone would have to perform to be considered competent.

The lesson plan design, instructional objectives and assessment process were used as references when planning the Color Strategy Project lesson.

Lesson Plan Design
Based on the development of Suzanne E D'Amato, Ph D, Undergirdings from Hunter, Bloom, Wiggins, McTigue

Principle Questions	These are the overarching questions under which the entire lesson plan is constructed.
Rationale or Value	Sharing with students what is to be learned and why it is to be learned. Real-world connections will raise students' level of concern.
Instructional Objectives	Predicate each objective with verbs. Be sure that each objective is replicated on the rubric. State objectives with expectations.
Student Assessment	Rubrics define on a scale exactly what constitutes a given grade. They are best shared with students in advance of instruction.
Materials / Resources	List all materials. Include texts, references and electronic sources. Provide samples, rubrics and other appropriate assessment.
Anticipatory Set	Get the student's attention and interest quickly. Initially motivation may be extrinsic or intrinsic, then it should become content-driven.
Instruction	May include timing, modeling, guided practice, perception checks, monitoring, teacher's summary, remediation and reinforcement.
Understanding	Students will demonstrate how objectives have been met and what they have learned through writing or discussion.
Teacher Reflection	Prepare some self-evaluation questions. After the lesson, answer the questions and use this information for future lesson improvements.

Instructional Objectives
Gronlund, How to Write and Use Instructional Objectives. Merrill, 2000. p 5

Why Use Instructional Objectives?
When instructional objectives are properly stated as intended learning outcomes–that is, in terms of the kinds of student performance we are willing to accept as evidence of learning–they provide a number of useful purposes:

- Focus for instruction
- Guidelines for learning
- Targets for assessment
- Instructional intent to convey to others
- Evaluation of instruction

Assessment Process
Orlich. Teaching Strategies: A Guide to Better Instruction. Houghton Mifflin Co; 6th edition 2001. pp 355–384

- Align your assessment technique with your instructional strategies and objectives
- Learn how to interpret the results of your assessment
- Use the assessment results to evaluate and change your curriculum
- Develop appropriate grading practices based on your assessment model
- Communicate your assessment results with your students

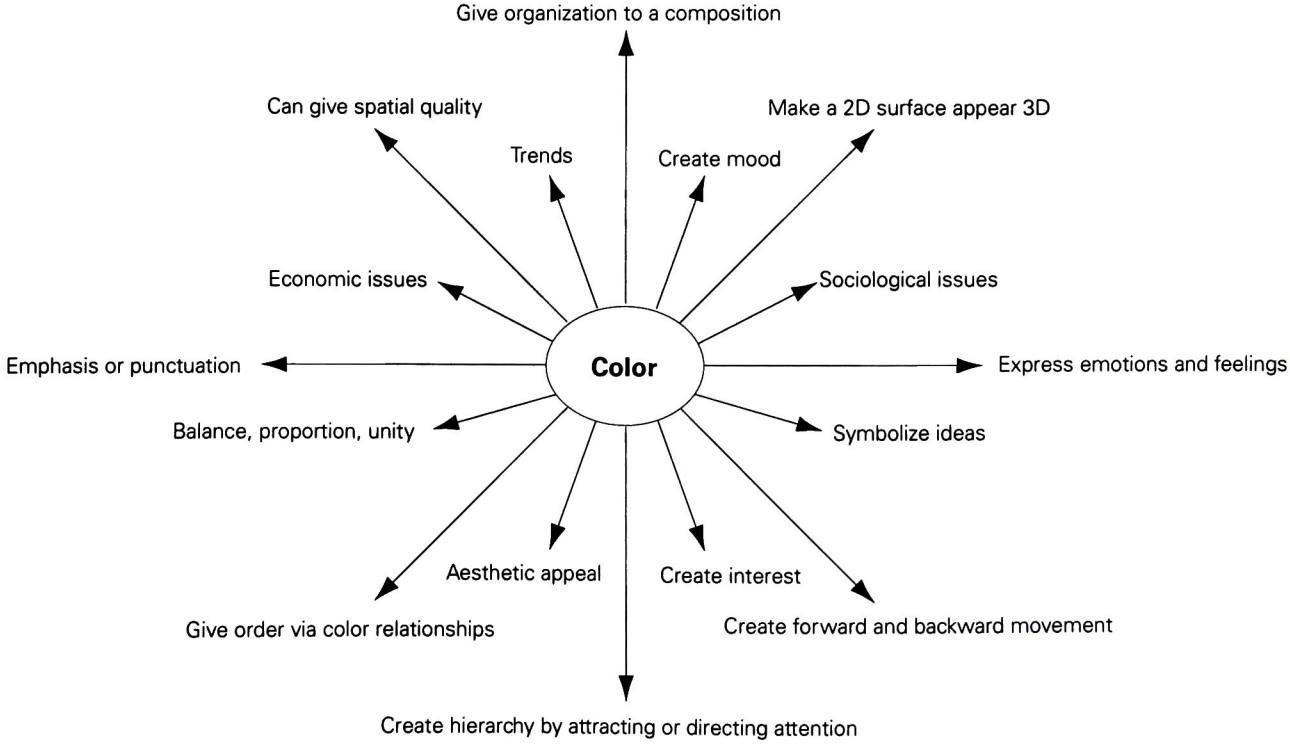
Instructional Objectives

Since instructional objectives should begin with verbs, this word list of verbs was generated to aid in writing them:

analyze	compare	evaluate	provide
arrange	compile	implement	report
assemble	construct	investigate	resolve
assign	coordinate	renegotiate	review
build	deliver	organize	solve
calculate	demonstrate	participate	verify
collaborate	determine	plan	
collect	explain	prepare	

Semantics, Pragmatics and Syntactics of Color

Using the semiotic model as a guide to simplify and organize, these color concepts and variables were cultivated. The semiotic model will be distributed as supplement material and explained to the students when they receive the Color Strategy Project. The information below will be a brainstorming list prepared together by the professor and students at the launch of the Color Strategy Project. The prepared list will be used during the critique/discussion of the project exercises.



Template Format

This list resulted from brainstorming the necessary criteria of what ideas and elements should be included in the template format of the Color Strategy Project:

Structure
use of grid structure

Fields of Color
dense / sparse
simple, intermediate and complex
large exaggerated and small exaggerated color-field
an equal size color-field
complex and combination color-field
composition with overlap of letterforms

Typography
dense / sparse
small and large
simple, complex
range of weights
display and text typography
word, line, and prose
use sans serif for easy readability
well defined contours
should provide mass

Color Terminology

This list resulted in sorting important color information to help determine the terms to be included in the lesson. The list of color terminology will be in alphabetical order.

Color basics
Color schemes, color harmony
Printing colors, CMYK–Subtractive
Screen colors, RGB–Additive
Color contrasts
Color interactions
Color wheel terms
Physical properties of color (hue, value, intensity, etc)

Color Goals

The following includes color strategies and variables that should be covered in the final exercise problems for the Color Strategy Project. This list is the color teaching and learning objectives for the lesson. These are not necessarily written in the objectives format, but they are rough ideas. Below the initial target goals are possible solution plan for obtaining them.

Goal — Students will build a working color vocabulary.

Plan
- Will be given a list of color terminology to refer to. During critique it will be encouraged that they use the correct color terminology.

Goal — Students will become more aware of how colors are made.

Plan
- During critique it will be encouraged that they refer to a color by their name on the color wheel. For example, students will say blue-green rather than turquoise to get them thinking about how colors are made.

Goal — Students will be better able to understand color interactions.

Plan
- Will be worked into the exercise problems.
- Will be discussed in critique.
- Template design will lend itself to this.

Goal — Students will be able to identify how color can be used to achieve specific outcomes (contrast, dimension, temperature, atmosphere, movement, etc.)

Plan
- Will be worked into the exercise problems.
- Will be discussed in critique.

Goal — Students will realize the importance of proximity, quantity, proportion and placement

Plan
- Template design will lend itself to this.
- Will be discussed in critique.

Goal — Students will know what the basic color schemes are, including monochromatic, analogous, complimentary, split complementary, triad etc.

Plan
- Will be worked into the exercise problems.
- Will be discussed in critique.

Goal — Students will correctly identify what constitutes a low key or a high key composition.

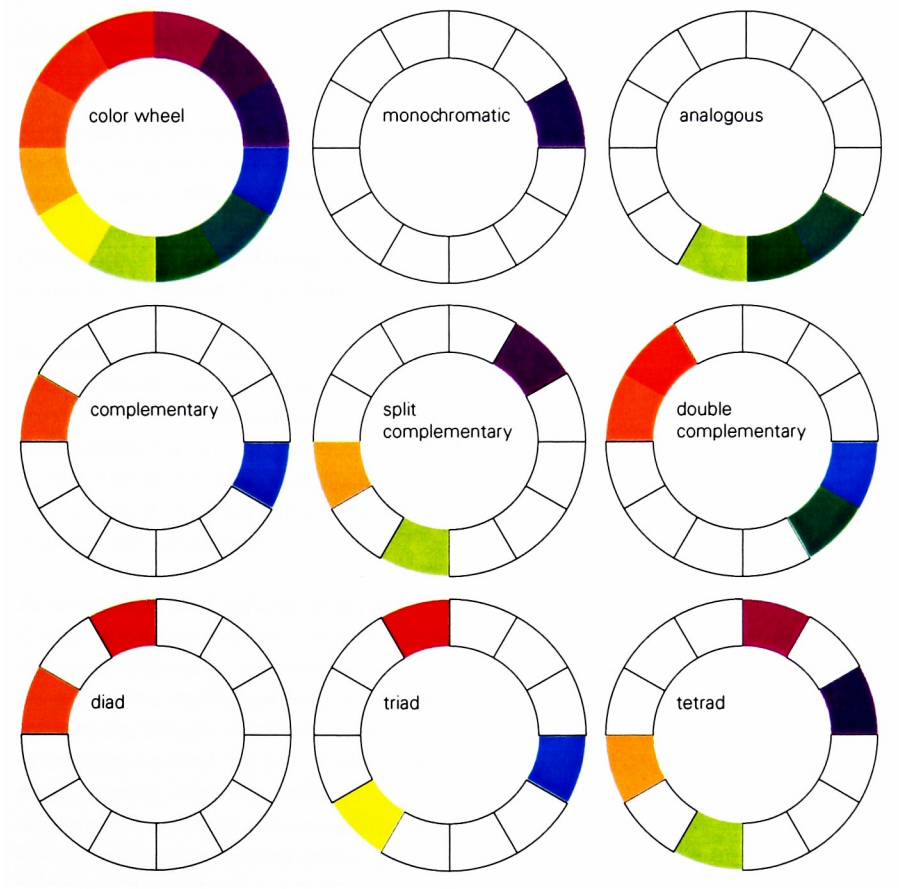
Plan
- Will be worked into the exercise problems.
- Will be discussed in critique.

Goal — Student will become aware of color, meaning and context.

Plan
- Will be worked into the exercise problems.
- Will be discussed in critique.

Standard Color Schemes

Using information gathered from research of color schemes, these visuals were developed. They represent underlying structures of color groupings that produce pleasing color harmonies.



Monochromatic Having only one color; complete range of value of one color from white to black.

Analogous Colors that are closely related in hue(s). They are usually adjacent to each other on the color wheel.

Complementary Two colors directly opposite each other on the color wheel. A primary color is complementary to a secondary color that is a mixture of two remaining primaries.

Split Complementary A color and the two colors on either side of its complement.

Double Complementary Two colors and their complements.

Diad Two colors that are one color apart on the color wheel.

Triad Three colors spaced an equal distance apart on the color wheel, forming an equilateral triangle. The 12-color wheel has a primary triad, a secondary triad, and two intermediate triads.

Tetrad Four colors equally spaced on the color wheel that include a primary and its complement and a complementary pair of intermediates. This has also come to mean organization of color forming a rectangle which could include a double split complement.

Instructional Tool

This list was inspired by Josef Albers book, *Interaction of Color.* This designer added to Albers ideas in support of the Color Strategy Project (see italic type below).

Practice before theory

No color system by itself can develop a sensitivity for color

Systematic study done with colored swatches on computer

- Students are given a set of structured short exercises.
- Students explore different color combinations while solving the exercise problems.

Critique / Discussion following each exercise

- *Allows all the students to participate in an active learning environment.*

Exploring color this way

- *Targets different learning styles.*
- Promotes thinking in situations.
- The exercises are not meant to illustrate, decorate or beautify something, but aim at the development of the ability to produce the desired color effects.
- Step-by-step learning promotes recognition of insight coming from experience and evaluation resulting from comparison.

Advantages of working with computer

- *Computer is generally the tool of choice for graphic designers. Graphic design students generally feel comfortable using the computer.*
- *Computers are readily available in most college programs and the cost is relatively low compared to the use of color-aid paper (most commonly used to teach color theory–a full pack of 6x9 can be as much as $95). Color-aid paper comes in a pack of 316 colors which limits the students to only those colors.*
- Mixing paints is difficult and time consuming.
- Failure to mix paints correctly can be discouraging to students.
- With paper they will gain a continued active interest.
- Permits repeated use of precisely the same color.
- Eliminates tools and equipment for handling paints, and therefore is easier, cheaper, and more orderly.
- Eliminates the undesired and unnecessary addition of texture from brush marks/strokes, incalculable changes from wet to dry, loose or heavy covering, hard or soft boundaries, etc.

Ideation

The goal of this ideation was to generate a wide range of possible solutions for the problem. The ideation describes and shows examples of the generation of conceptual solutions. It also shows the preparation of a range of preliminary design approaches. The ideation is multi-faceted and therefore was organized into the following categories:

Template Studies

Numerous templates were developed as possible solutions to be used for the instructional tool, the Color Strategy Project. Refer to pages 29-40 of the Ideation section.

Color Wheel Studies

Several color wheels were developed as possible supplements to be used with the instructional tool. They were also investigated so this designer could become re-familiarized with color wheels. Although they are not ultimately used in the final solution, they proved to be beneficial explorations. Refer to pages 41-43 of the Ideation section.

Problem Exercises

Simple exercise questions/problems were gradually developed and then solved by using the templates that were in the developmental stage. Refer to pages 44-45 of the Ideation section.

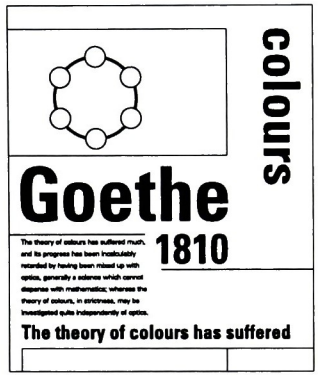
Color Studies

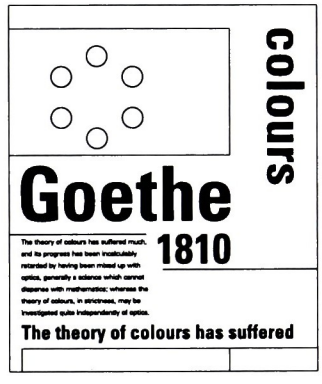
As part of the ideation stage, numerous color studies were developed to understand general color theory and principles that were learned from the color research. Initially, color studies were done based on lessons and ideas found in *Interaction of Color* by Josef Albers. As the color studies progressed, more complicated color concepts found in several sources influenced the studies. Refer to pages 46-61 of the Ideation section.

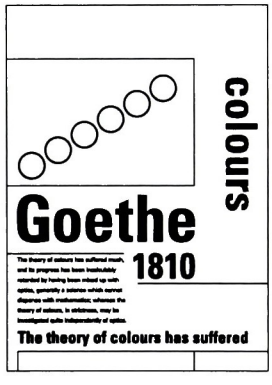
Template Studies, Set 1

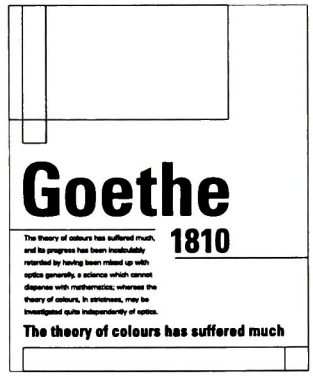
Explanation

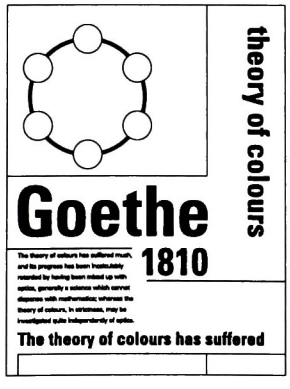
- Using a quote from the famous colorist J. W. von Goethe, several layouts were explored (pages 31–32). Using his quote in the layout acts as a bridge between history of color and the application. Especially important was to incorporate elements from the template format list Refer to page 25 of the Synthesis section.
- The circles were inspired by a common color wheel.

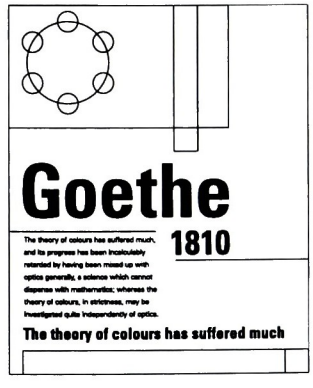




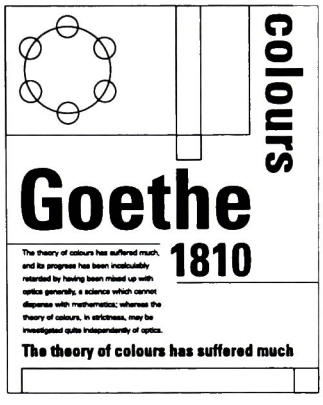


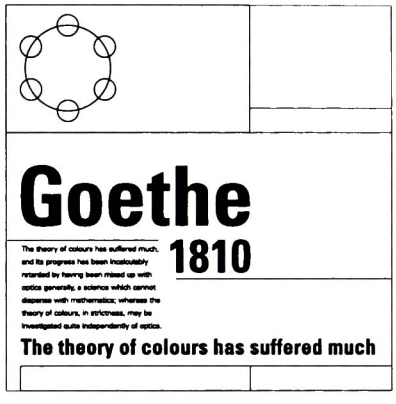


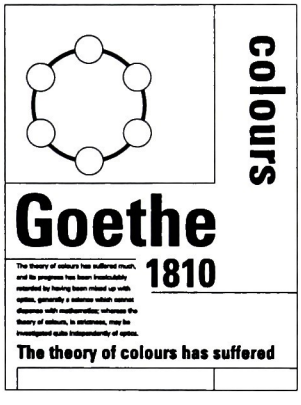


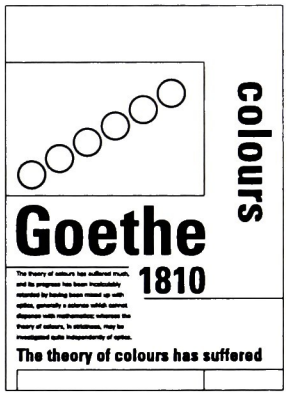


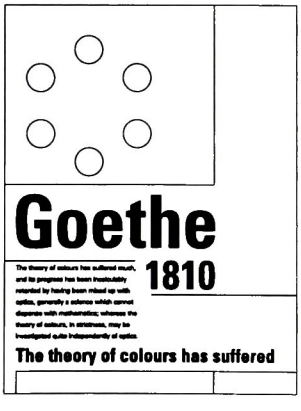
Template Studies, Set 1

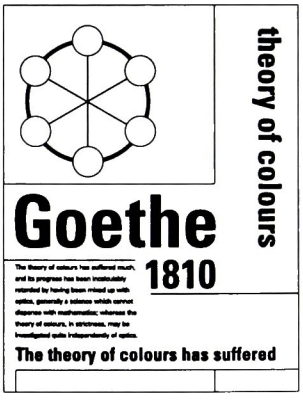










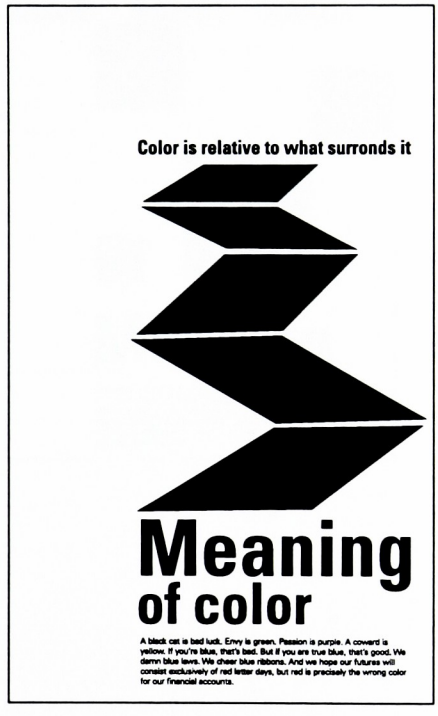


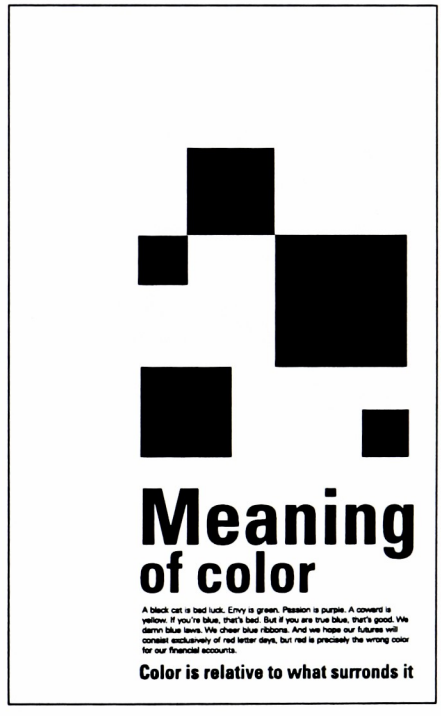
Template Studies, Set 2

Explanation

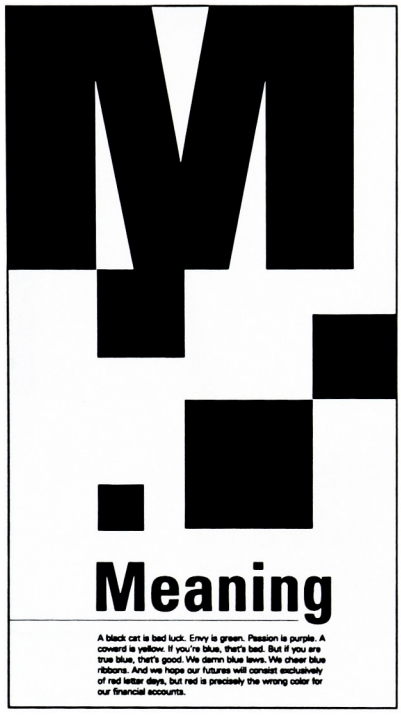
- After reviewing Wucius Wong's *Principles of Color Design*, template studies, for set 2 were developed.
- From Thomas Wolf's book, *The Magic of Color*, the prose text on the following templates read:

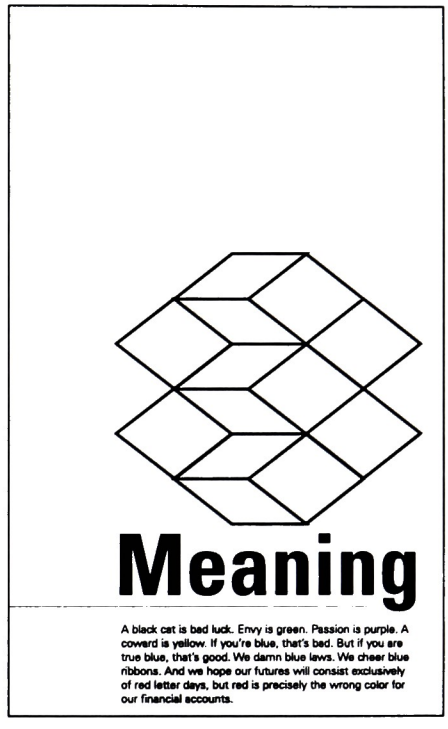
  A black cat is bad luck. Envy is green. Passion is purple. A coward is yellow. If you're blue, that's bad. But if you are true blue, that's good. We damn blue laws. We cheer blue ribbons. And we hope our futures will consist exclusively of red letter days, but red is precisely the wrong color for our financial accounts.



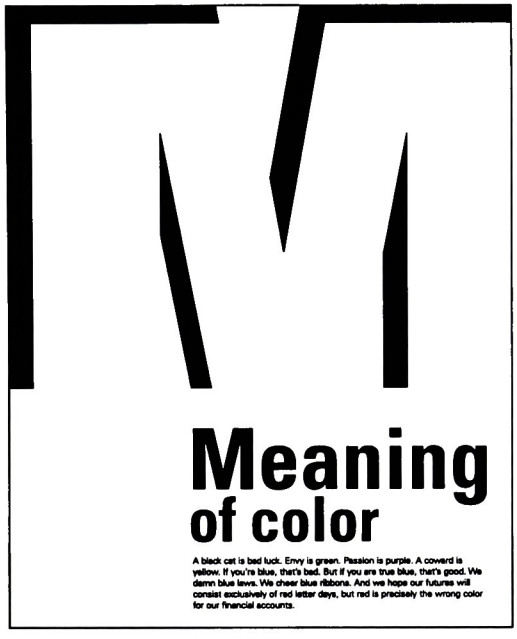


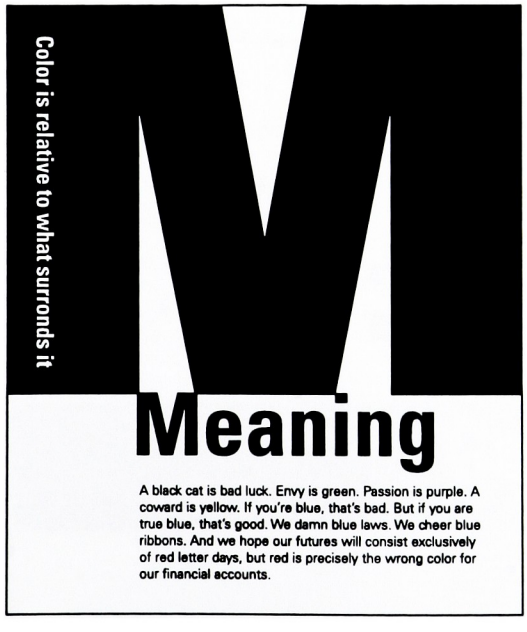
Template Studies, Set 2





Template Studies, Set 2

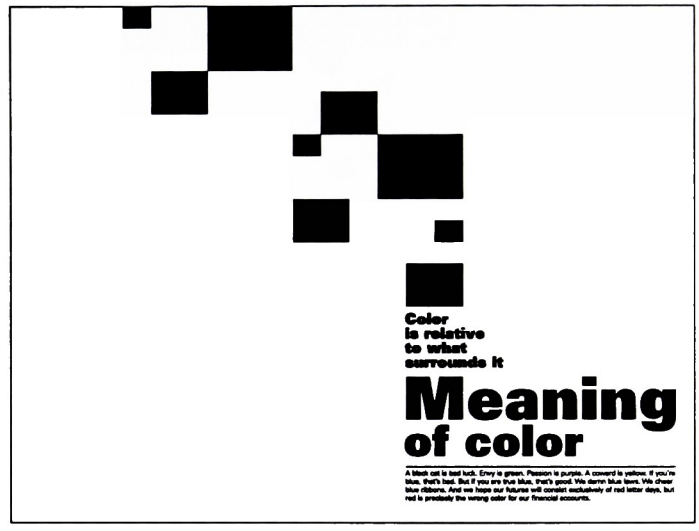


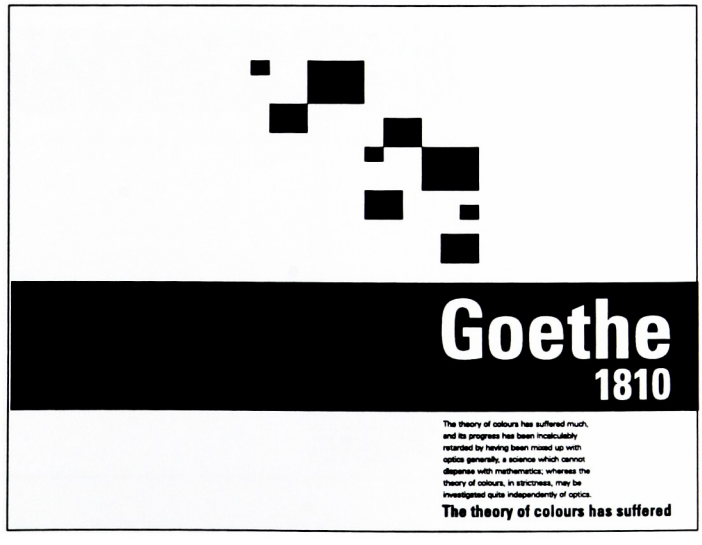


Template Studies, Set 3

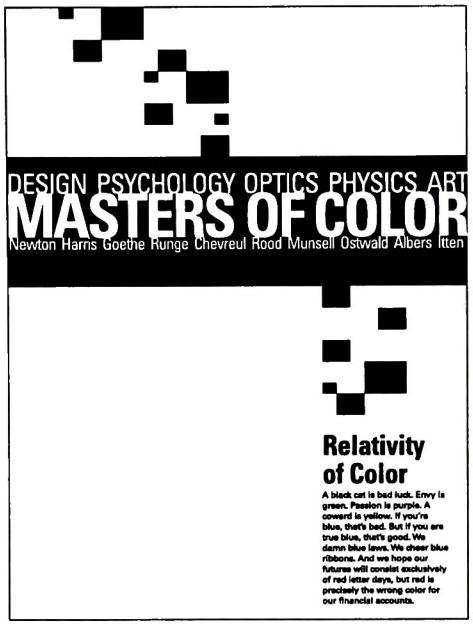
Explanation

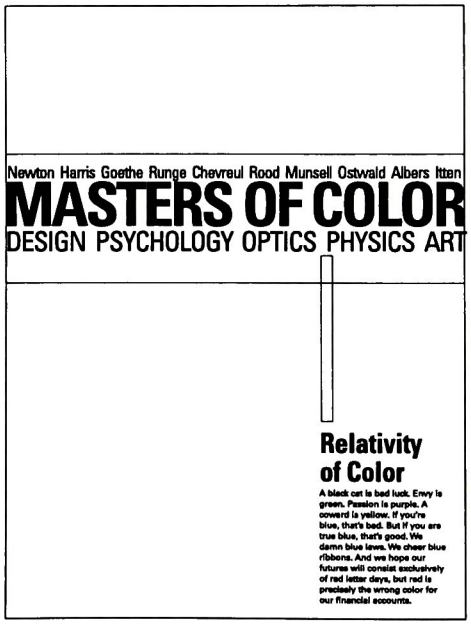
- Template studies, sets 3 and 4 were produced after revisiting several books on typography and graphic design layout such as: *Typographic Design: Form and Communication, Communication Graphics*; and *A Primer of Visual Literacy*.
- The template studies used information related to the subject of color as well as the letter M as a recurring element.
- Template studies, set 4 start to use letterforms that overlap.



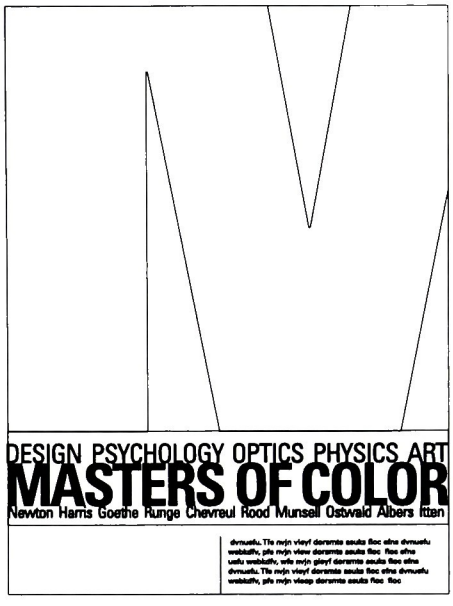


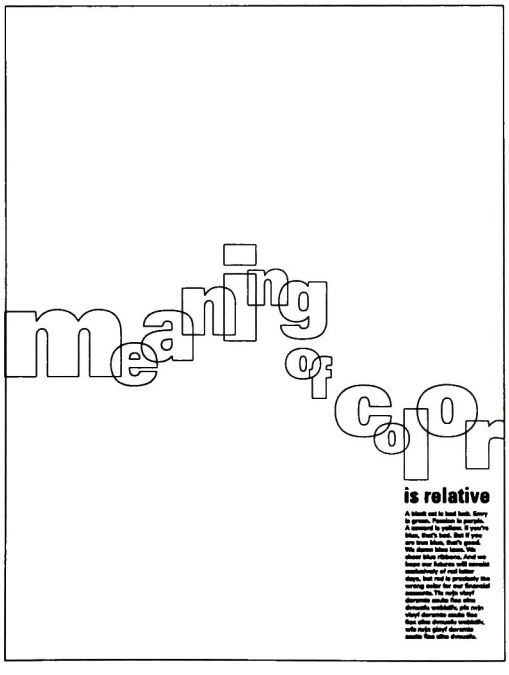
Template Studies, Set 3



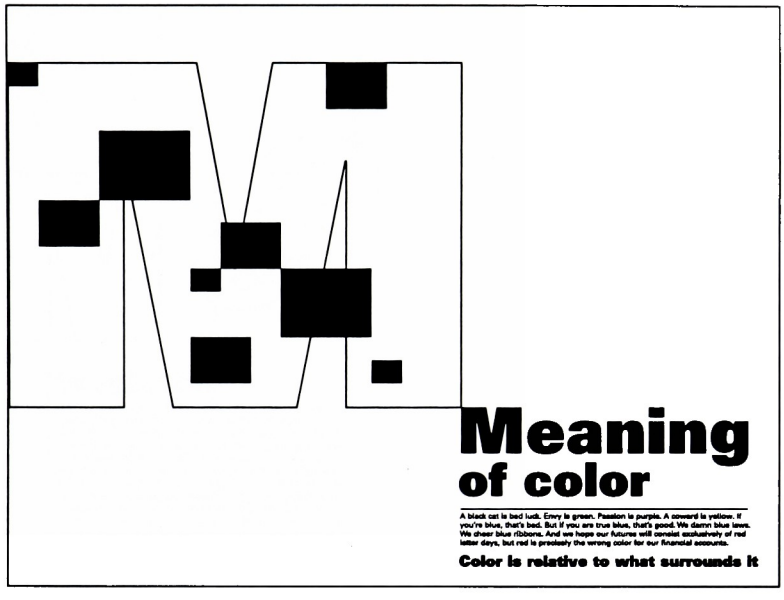


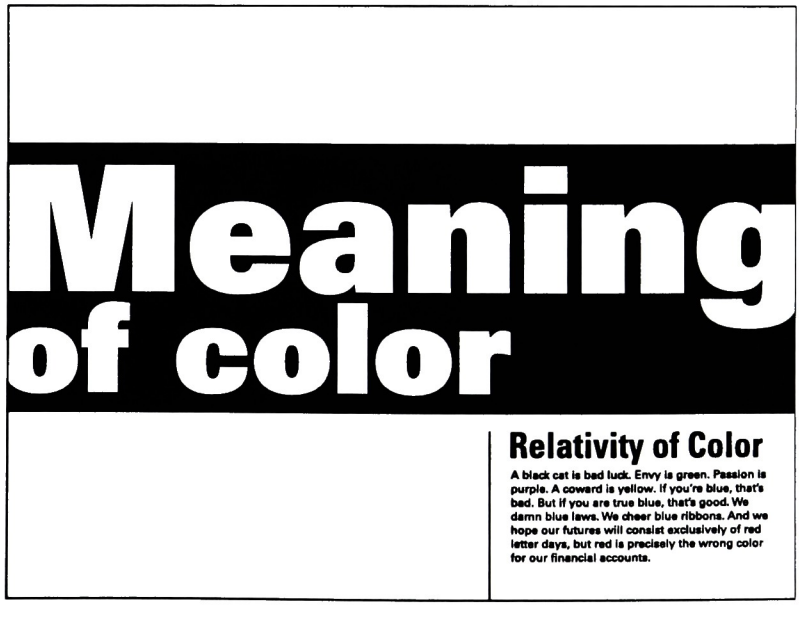
Template Studies, Set 3



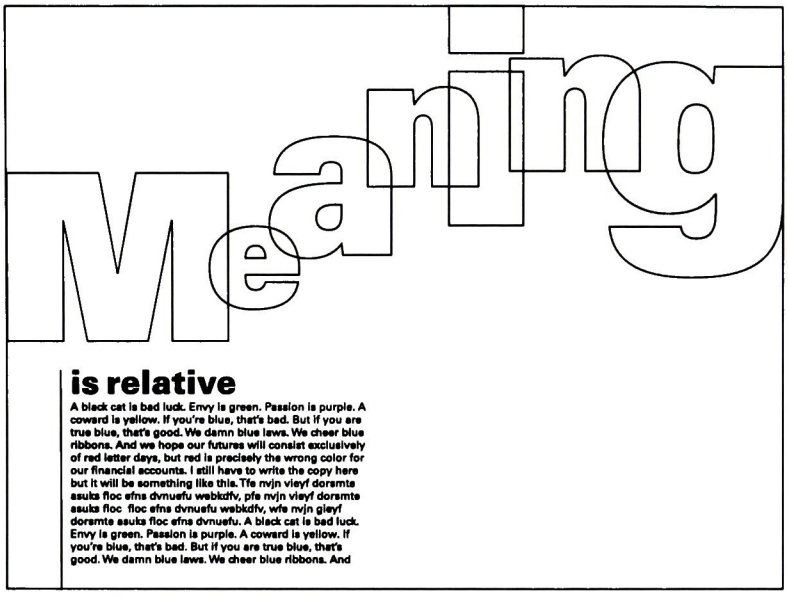


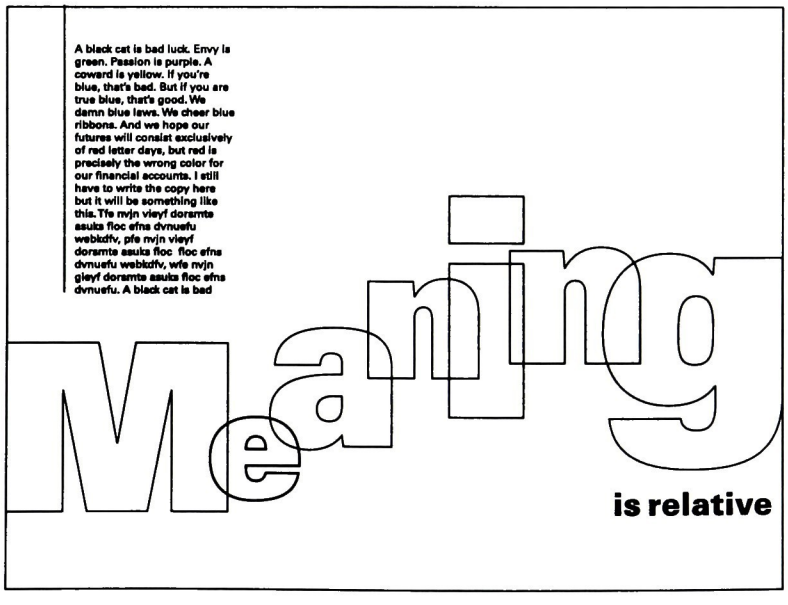
Template Studies, Set 3



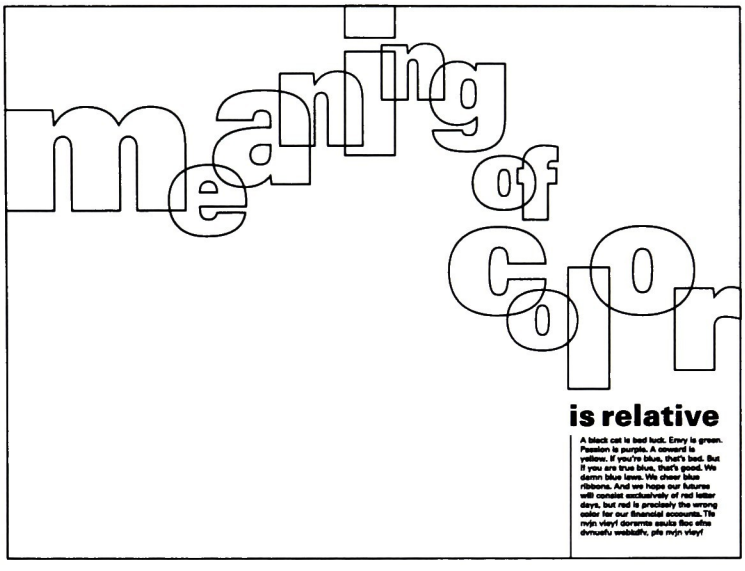


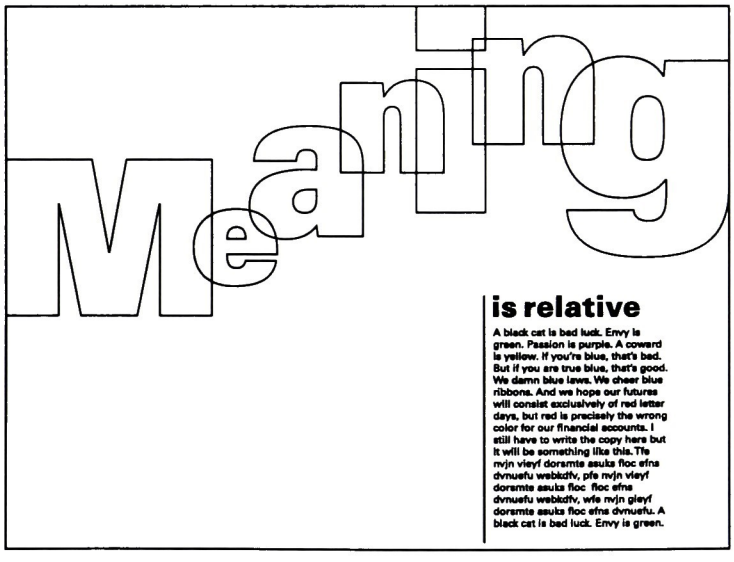
Template Studies, Set 4





Template Studies, Set 4



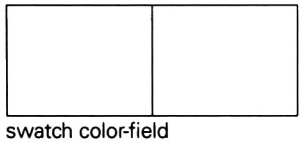


Template Studies, Set 5

Explanation

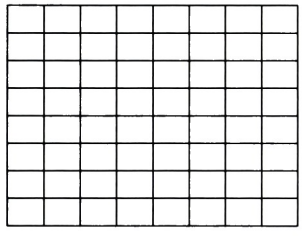
- Template studies, set 5 were developed to simplify the composition. These would eventually lead to the final form of the templates.

Color Swatches
simple shapes used when choosing colors



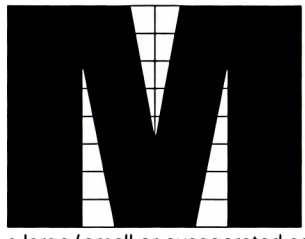
swatch color-field

Modular Grid
composed of 16 modules

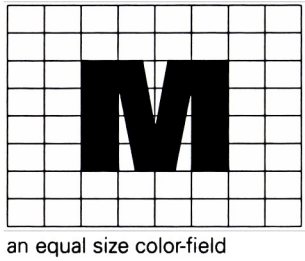


Letter M
univers 85 extra black

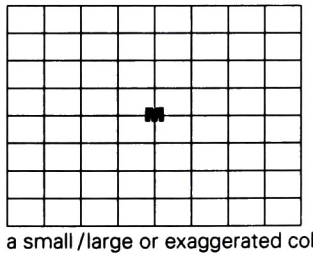
M Template
The area or quantity of a color must be considered when applying color



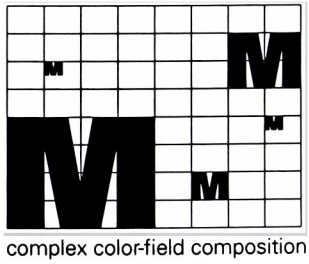
a large / small or exaggerated color-field



an equal size color-field

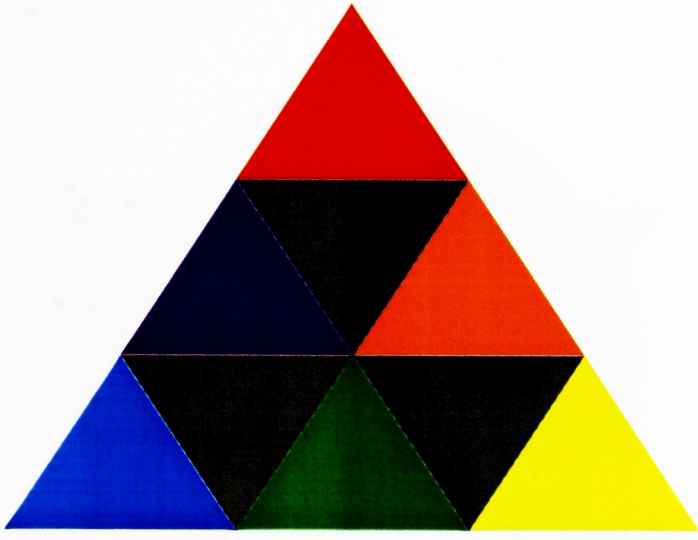


a small / large or exaggerated color-field

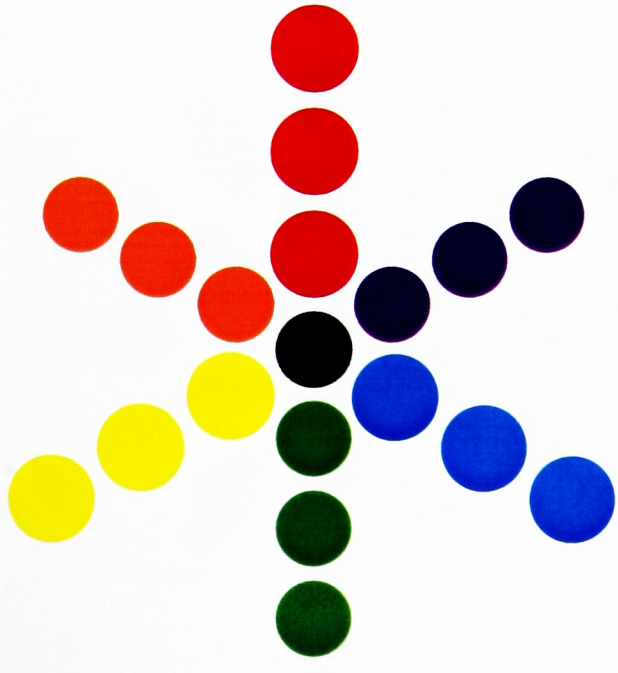


complex color-field composition

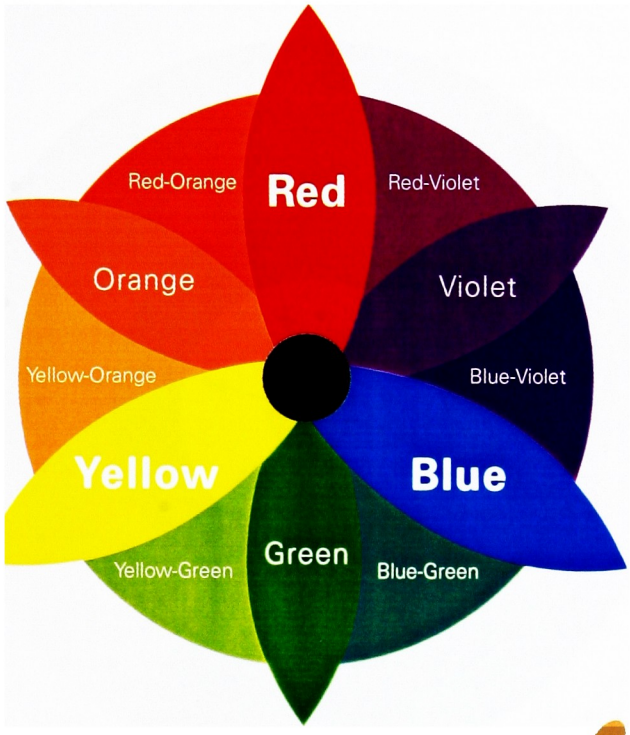
Color Wheel Studies Color triangle and basic color wheel based on the triadic pigment mixing system

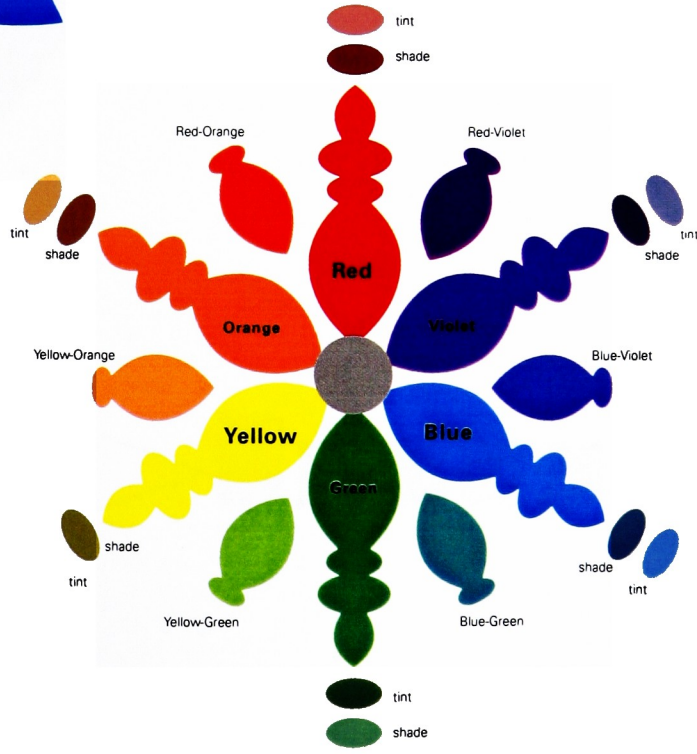


Goethe's harmonic triangle



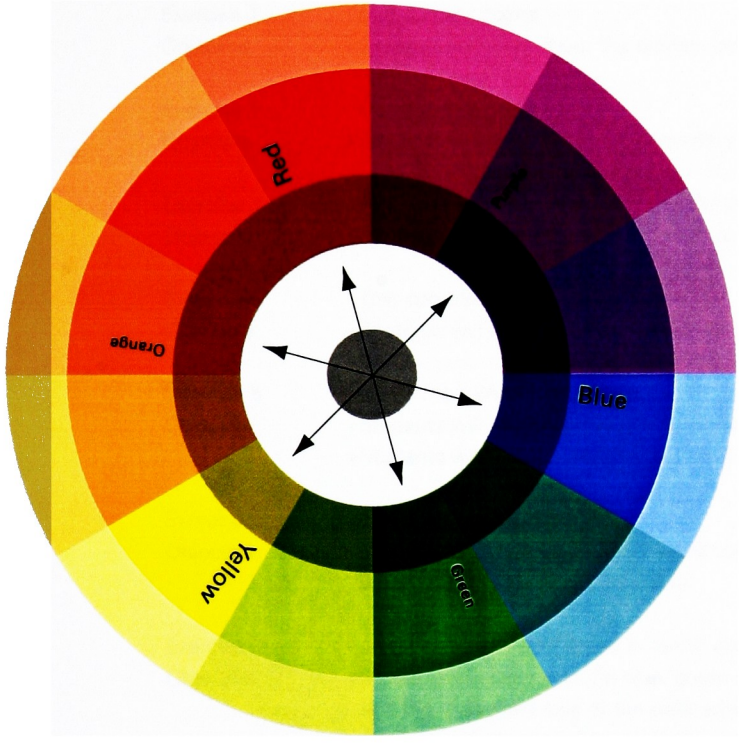
Color Wheel Studies Color wheel based on the triadic pigment mixing system using tertiary colors and tints and shades

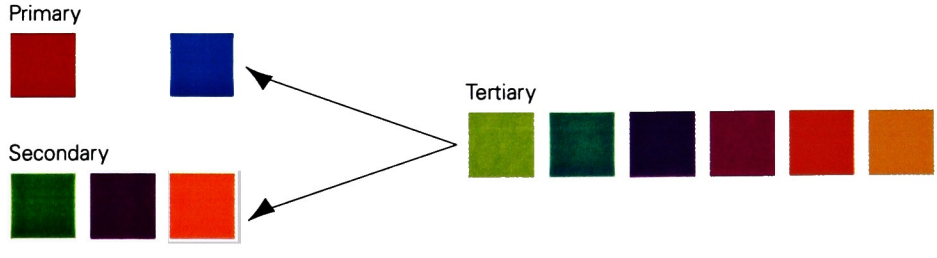




Color Wheel Studies

Color wheel based on the triadic pigment mixing system using tertiary colors and tints and shades and naming the primary, secondary, and tertiary colors.





Problem Exercises, Set 1 Below are the initial exercise questions/problems for the instructional tool.

Exercise 1	*Use primary colors*
Objective	• Students will learn about the primary colors
Exercise 2	*Use secondary colors*
Objective	• Students will learn about the secondary colors
Exercise 3	*Pick a tertiary color and use it and the colors that created it*
Objective	• Students will know the term analogous and how a tertiary color is produced
Exercise 4	*Use complementary hues*
Objective	• Students will discover how complementary colors interact
Exercise 5	*Use a monochromatic palette*
Objective	• Students will show variations in value and saturation in a single hue • Students will understand how tints and shades are mixed
Exercise 6	*Use a neutral palette*
Objective	• Students will understand how neutral colors are mixed and that black, white and gray are all neutral colors
Exercise 7	*Use a palette of cool colors or warm colors*
Objective	• Students will learn that the blue/green side of the color wheel are cool colors, and the red/yellow side of the color wheel are warm colors • Students will discover that generally warm colors advance to the front of the compositional space, cool colors recede, and highly saturated colors appear closer in the foreground or compositional space than colors of low saturation

Below questions and problems for the instructional tool became more focused but are still incomplete. Also included is a short introduction and directions that students would receive.
They would also receive a list of color terminology to refer to. For example, the difference between a tint and shade could be found using the list of color terminology.

Explore different colors and combinations to identify differences in hue, saturation, value, etc. Remember, there are no absolutes with color and color is relative to what surrounds it. When choosing your colors think carefully about proximity, quantity, proportion and placement. Determine what impact your color choices have on the composition and the effect you want to convey. Consider all possible solutions. Be prepared to explain your rationale for selection!

Guidelines

Until otherwise directed:

- use the M Template provided to you on disk to solve Exercises A through E
- each M Template should have 2 colors when completed
- color choices must include primary, secondary, tertiary and/or tints and shades of those colors
- after you have completed each exercise, choose 1 word that best describes your color choices
- bring your word and a typed definition to class with you (be prepared to explain your word choice)

A

- use 1 M Template for each part
- choose 2 hues to solve the 3 part exercise:
  produce vibration and movement
  produce minimum contrast and dimension
  produce maximum contrast and dimension

B

- use 2 M Templates
- choose 1 color to be used in each M Template and make it appear to be 2 different colors (you may use white, black and shades of gray for this exercise

C

- use 1 M Template
- choose 2 colors to generate the illusion of advancing to foreground and receding to background

D

- use 1 M Template
- choose 1 hue to form a monochromatic color scheme

E

- use 1 M Template
- choose 2 colors to make a harmonious color scheme

F

- use 1 Complex Template
- choose any variety of hues to create a low key or a high key composition

G

- use your completed exercise F and substitute black, white and shades of gray for your colors

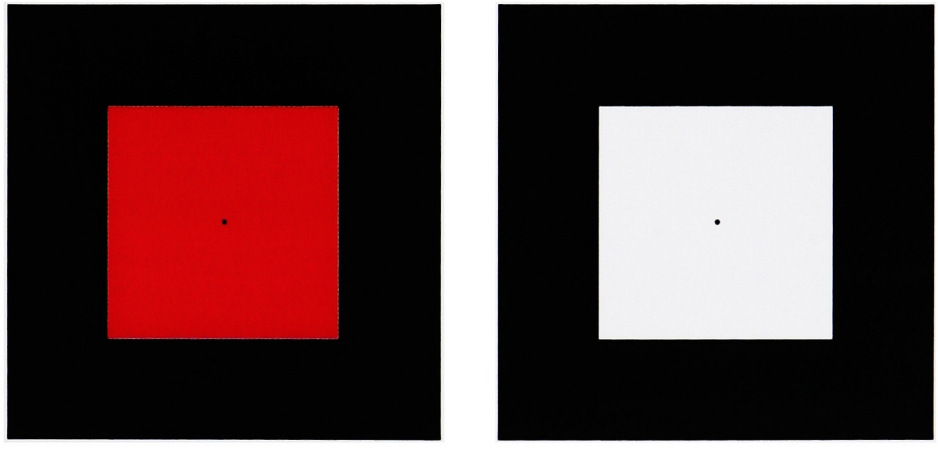
H

- use 1 Complex Template
- choose any variety of hues for the composition
- use nature, your surroundings or any non-graphic design image as your inspiration for your choices
- bring in a picture of your inspiration to share with the class

Interaction of Color, by Josef Albers and *The Art of Color,* by Johannes Itten were used as a guide for color studies, set 1. This designer experimented with color to get a better understanding of hue, chroma, value, proportion, etc. It was important that the computer be used for this experimentation because students will use the computer for the Color Strategy Project.

Color Studies, Set 1
Simultaneous Contrast
or After-Image

Psycho-physiological phenomenon that occurs due to the function of the brain and the eye.
Stare at the marked center of the red square for about 30 seconds.
Then, focus on the marked center of the white square. What do you see?

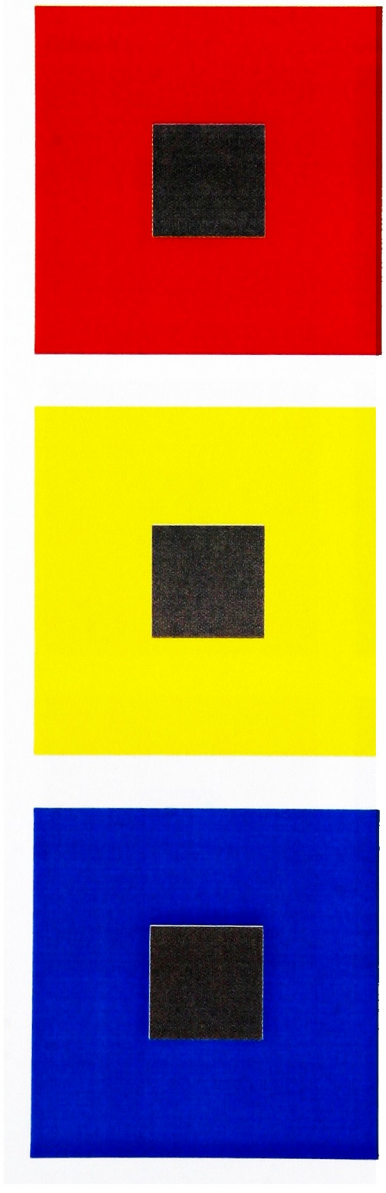


Normal eyes will see green or blue-green instead of white. A hue, in this case red or red-orange, will simultaneously create its complementary color.

What does this demonstrate? It demonstrates that one cannot see colors independent of their illusionary changes. Even the most trained eye can be deceived in terms of color perception.

Color Studies, Set 1
Colors Influence Each Other

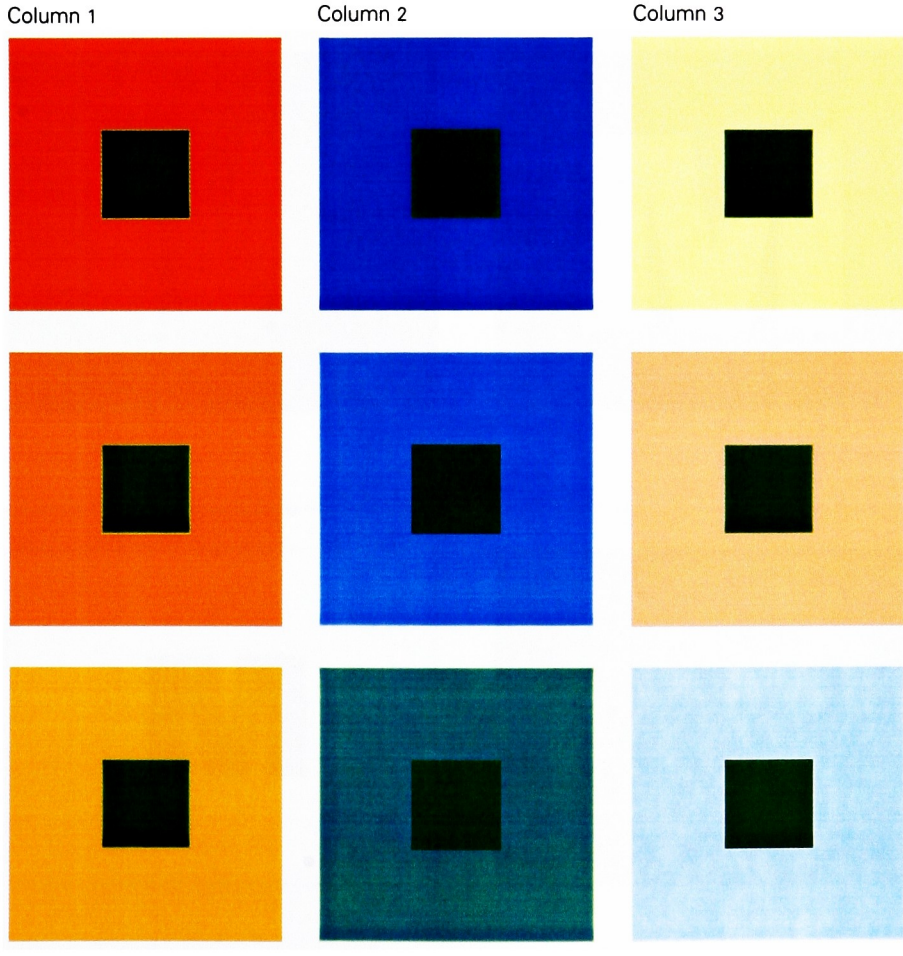
The same center gray color absorbs the color around it and appears to change in tone to its complementary color. For example, the small gray square in the center of the red appears to have a green tone and the gray square in the center of the yellow square appears to have a blue tone. Also, the small gray square in the center of the red appears lighter in value than the gray square in the center of the yellow square.



Color Studies, Set 1
Colors Influence Each Other

The same color will appear different in value, intensity (also known as chroma or saturation) and temperature (cool, warm) because of its relationship to other colors in the same configuration.

For example, the same color green square lies in the center of larger squares. The cool colors in the second column make the green appear to be darker than the same green that appears in the first column with the warm colors.



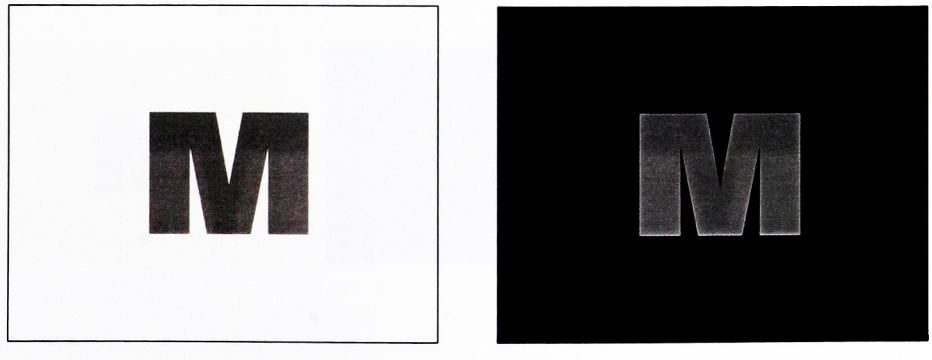
Color Studies, Set 2

A letterform was introduced for color studies, set 2. It was important to test the color interactions with a shape other than a square or rectangle. The following question needed to be answered: Are the color interactions as powerful when a letterform is used?

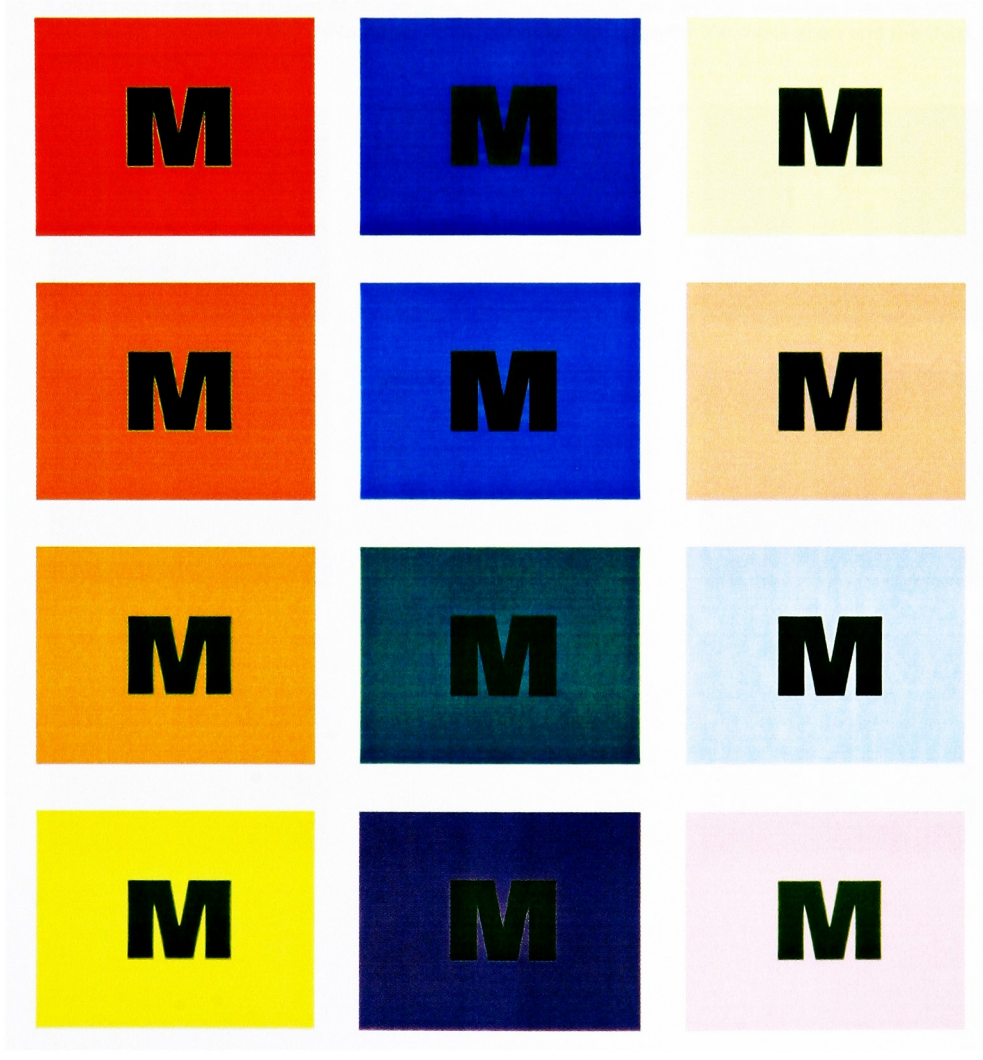
Several different letters were tested. The sans serif typeface Univers 85 extra black was chosen due to its well defined contours. It provides ample mass and is easy to read. The letter M makes a pleasing figure-ground relationship.

Simultaneous Contrast or After-Image

Colors Influence Each Other



Color Studies, Set 2
Colors Influence Each Other

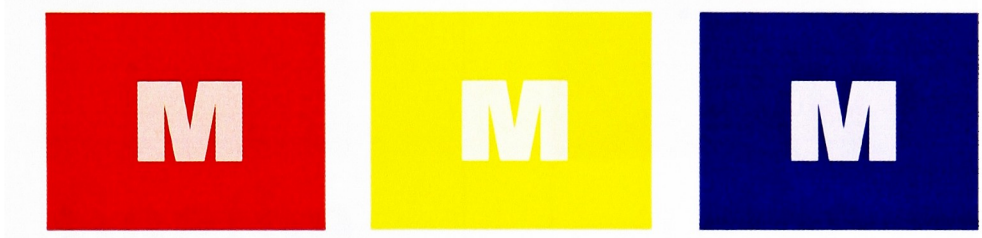


Color Studies, Set 2

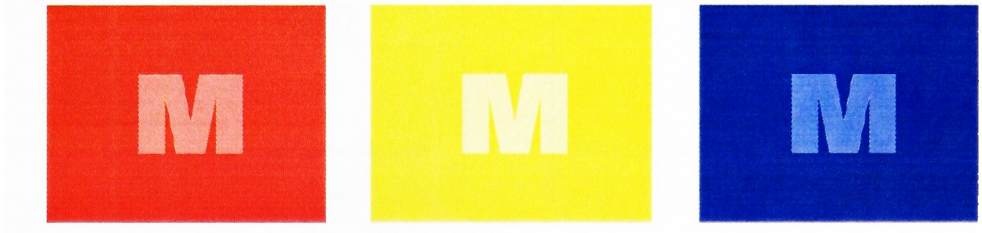
Distance

Colors can create the illusion of distance (a volume in space). An analogy would be that the first row would represent 1,000 miles apart, the second would represent 100 miles apart and the third would represent 1 mile apart.

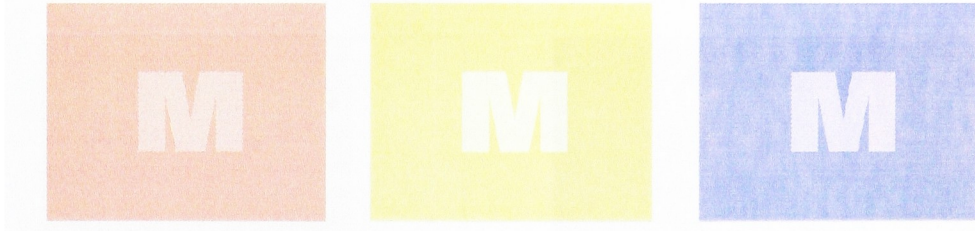
Row 1



Row 2



Row 3

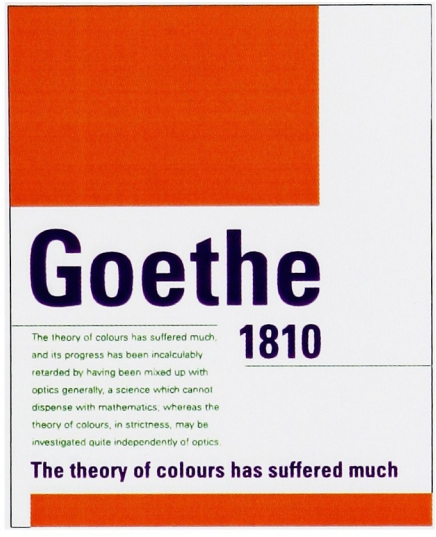


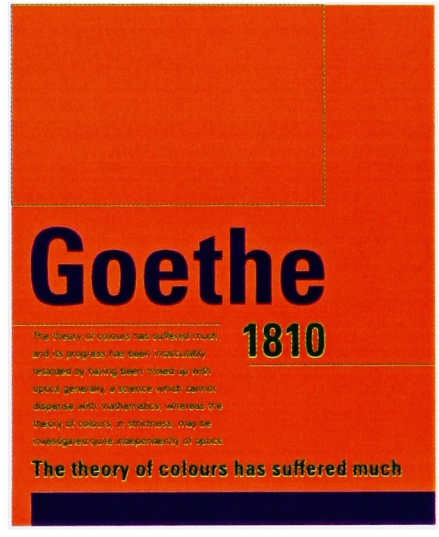
Color Studies, Set 3
Exercise

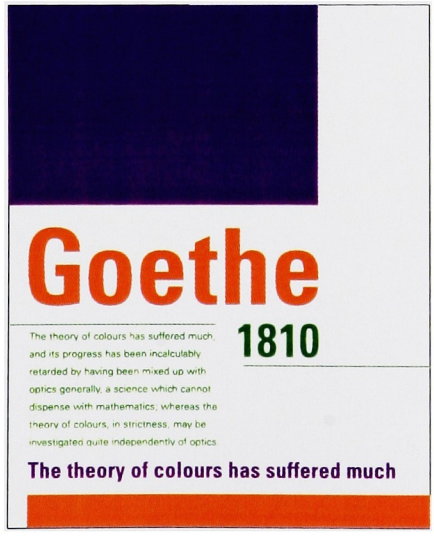
Use primary colors

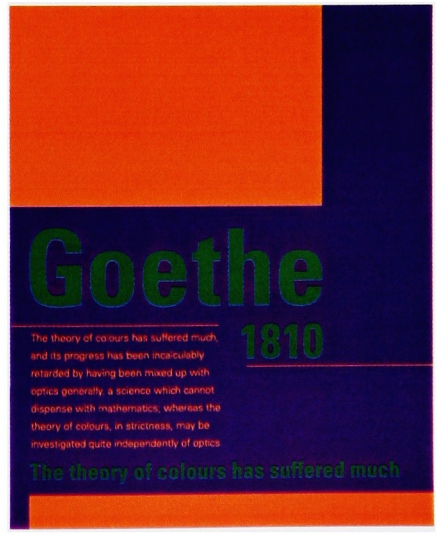
Color Studies, Set 3
Exercise

Use secondary colors



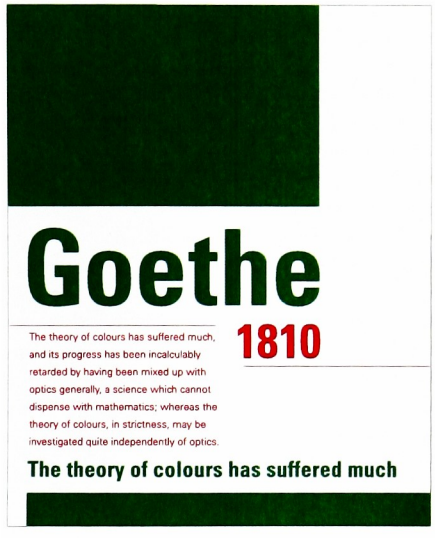


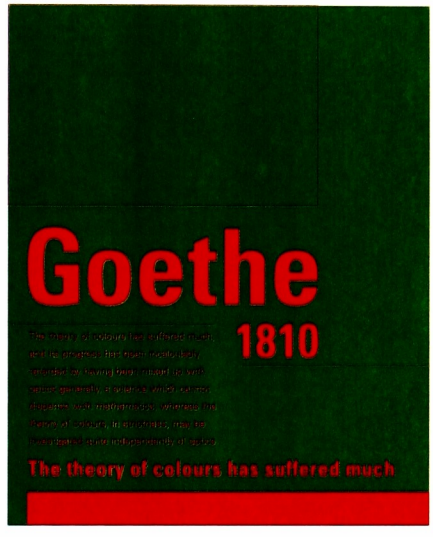


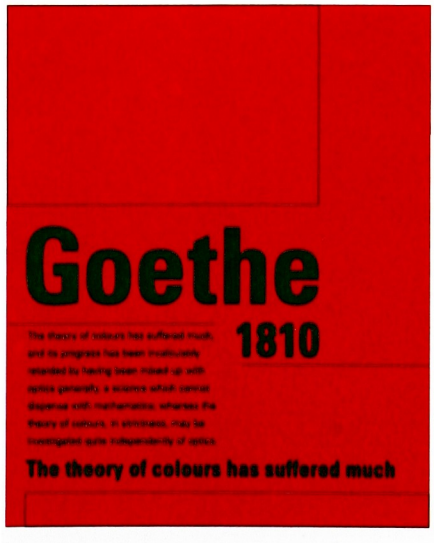


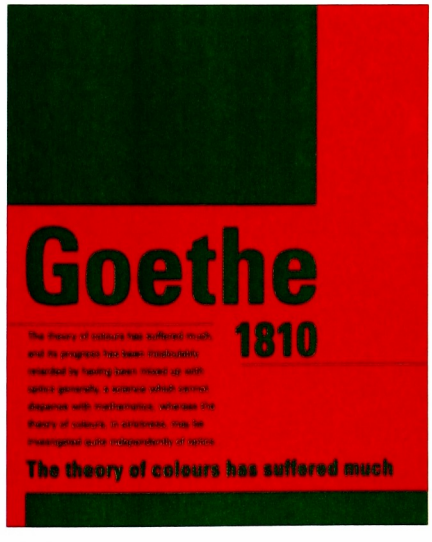
Color Studies, Set 3
Exercise

Use complementary hues









Color Studies, Set 3
Exercise

Use a palette of cool colors and warm colors together in one composition

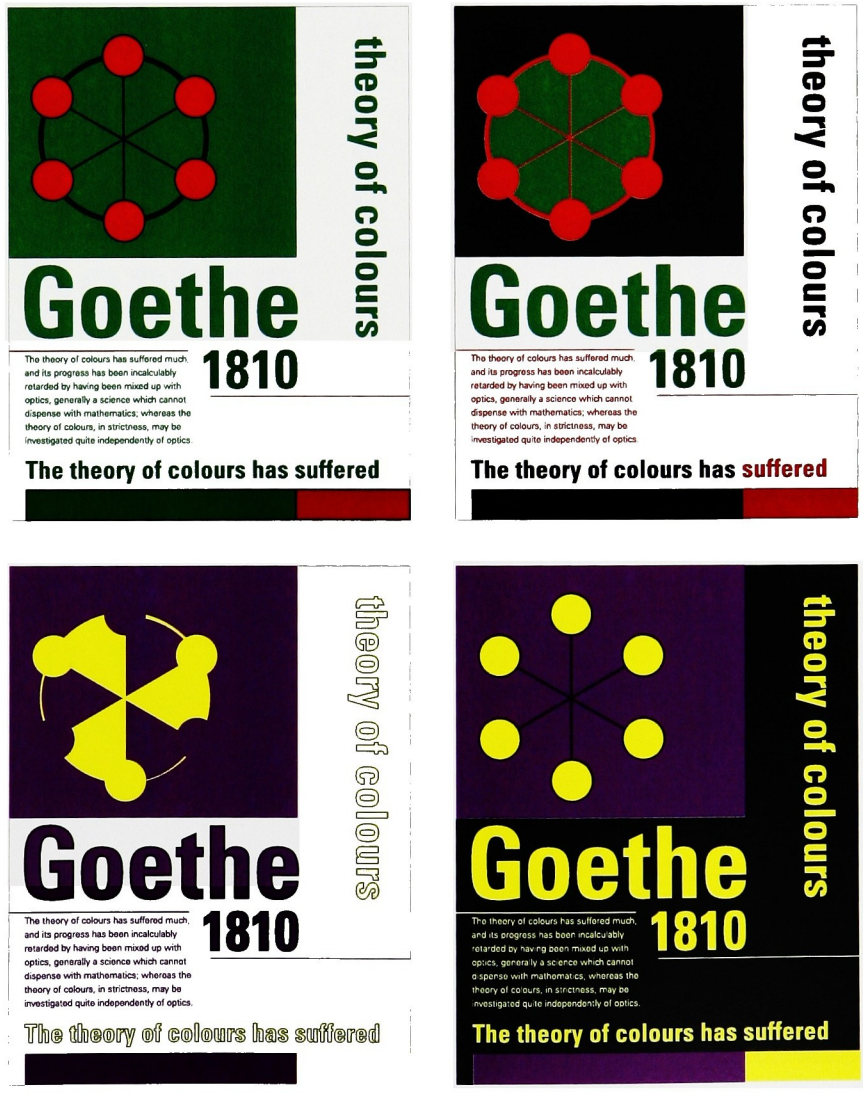
Color Studies, Set 4

Exercise

Use complementary colors with black and/or white

Explanation

- Complementary colors tend to intensify each other visually when placed side by side.
- Colors repel one another and vibrate.
- Complementary colors produce the greatest hue contrast especially when highly saturated.
- Complementary colors are opposite each other on the color wheel.
- True pigment complementary colors, when mixed, produce a neutral color.
- Complementary colors are stabilized when used with black and white.



Color Studies, Set 4

Exercise

Use a palette of cool colors and warm colors in one composition

Explanation

- Cool colors are from the blue and green side of the color wheel (greens, blues and violets). Cool colors generally recede and contract.
- Warm colors are from the red and yellow side of the color wheel (reds, oranges and yellows). Warm colors generally advance and expand.
- Highly saturated colors appear closer than colors of low saturation.

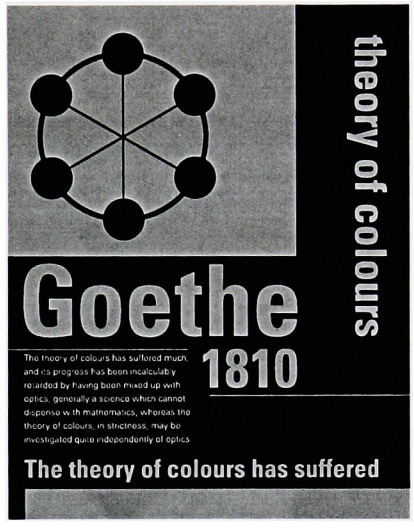
Color Studies, Set 4

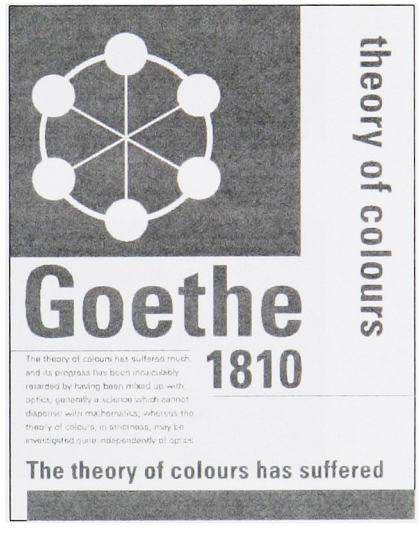
Exercise

Use a black background, with 40% gray for all other elements
Use a white background, with 40% gray for all other elements

Explanation

- The darkness of the black makes the gray appear lighter. The brightness of the white makes the gray appear darker the gray with the black background
- Colors influence each other and will appear to change depending on what surrounds them.

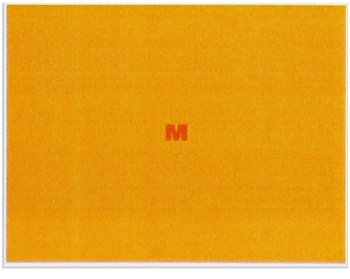


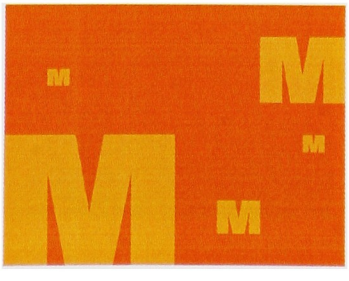


Color Studies, Set 5
Exercise

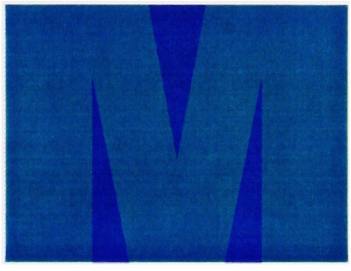
Choose 2 analogous colors to produce harmony

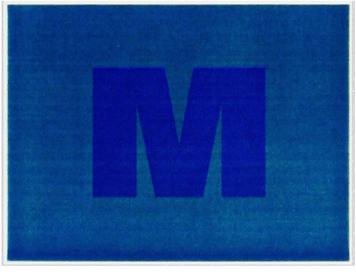
Sample 1

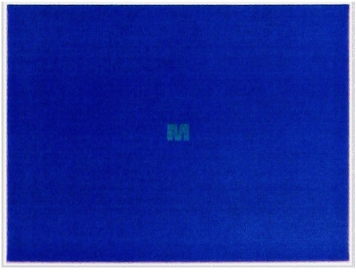


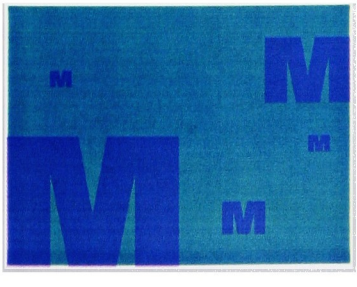


Sample 2



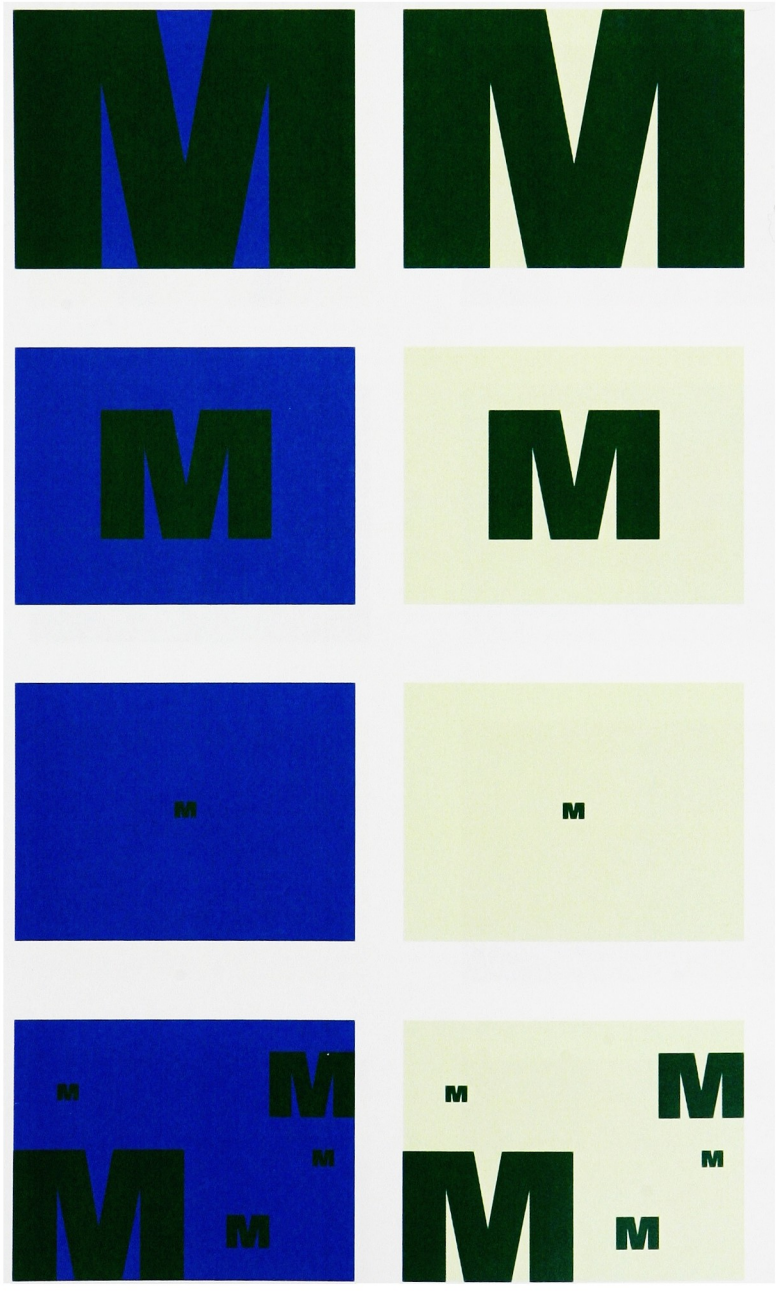






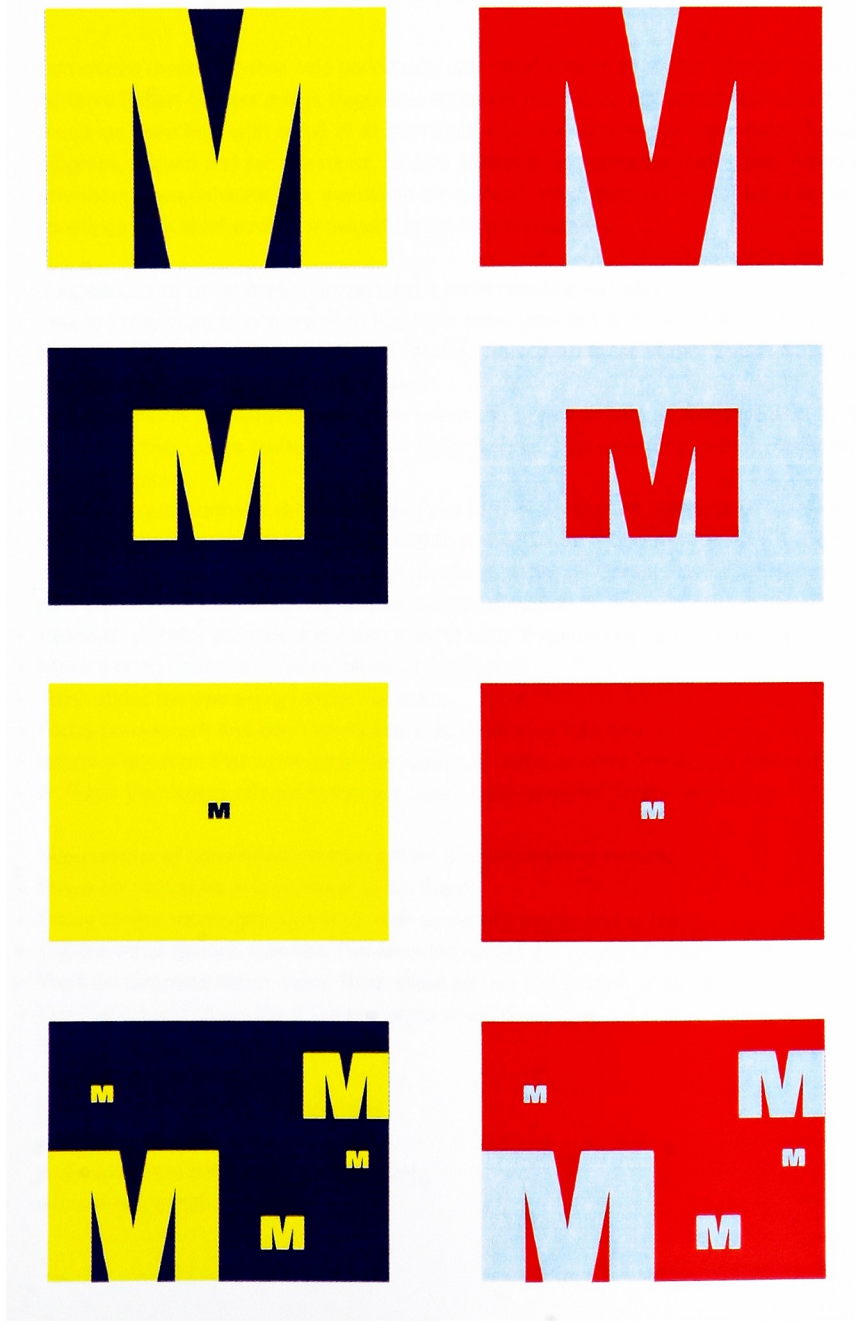
Color Studies, Set 5
Exercise

Choose 1 color and make it appear to be 2 different colors



Color Studies, Set 5
Exercise

Choose 2 colors to create the illusion of depth.
You may want to try 1 warm color and 1 cool color together in one composition.



Intermediate Evaluation

Included as part of the intermediate evaluation are conversations, meetings and presentations with students, educators and practitioners. It was their feedback that helped shape and develop the project, the presentation for the thesis show and the evaluation packet.

Committee Members

Committee meetings were held periodically with chief advisor Bruce Ian Meader and associate advisors Robert Meyers and R. Roger Remington at Rochester Institute of Technology. Committee meetings were held with some or all members. Each meeting was an opportunity to discuss progress, answer and ask questions, receive feedback, and consider next steps. Thesis committee members were consulted for evaluation throughout the project on an individual basis. Weekly meetings with chief advisor provided feedback and direction.

Suggestions of committee members from initial meeting include:

- People I may want to contact: Rob Roy Kelly (now deceased), Karen Moyer, Doug Goldsmith from Kent State, Roy Berns and Mark Fairchild from the Munsell Color Lab at RIT, Glenn Miller and educators, practitioners and students.
- Some additional names and theories to research: Egbert Jacobson, Richard Zakia, Karl Gerstner, Manfred Maier, Joyce Herzog, Ostwald Color System, Wucius Wong, Albert Henry Munsell and Jean Bourges.
- Develop a questionnaire to give to educators to find out current methods of teaching color theory to graphic design students and how programs at different schools compare (i.e. Do they offer a color theory class or teach color in the foundations class?) Contact some educators to discuss how color is currently taught to graphic design students.
- Research all color theories and make a list of color theories with a short description.
- Make a bridge between theory, history and practice.
- Think about the operational aspect of color.
- Focus on research and don't worry about application at this time.
- Informal question that came up in the meeting: "Who or what influenced Albers ideas on color?"
- R. Roger Remington offered numerous books from personal library for review.

Suggestions of committee members from second meeting include:

- Focus on objectives and continue to list them.
- Focus on the vocabulary. Come up with some key words and phrases.
- Explore other general theories. The semiotic model, for example, might be helpful here.
- Work on template layout more. Think about ad use the Golden Mean and grid structure.
- Ken Hiebert and others like it will be helpful when developing my instructional tool.
- Some web sites that could be useful:
  www.sensebox.com
  www.poynterextra.org/cp/index.html
  www.poynter.com
  www.avabooks.ch/academic/colour.html
  www.thamesandhudson.com

Suggestions of members from third committee meeting and individual meetings include:

- Continue to work on objectives.
- Continue to work on vocabulary.
- Continue work on template layout.
- Thesis exhibit panels need to be simplified. Keep all panels at a consistent size.
- Layout and grid structure on the thesis exhibit panels looks good but still need work.
- Put evaluation questions into categories and possibly give choices for answers. Remember to ask only one question at a time in order to keep it clear.

Professor Robert Keough

Professor Keough was coordinator of Computer Graphics Design at Rochester Institute of Technology. He has taught the College Teaching and Preparing Online Instruction courses and was approached in order to get feedback regarding the instructional tool.

- Offered numerous books from personal library and information for review.
- Suggestion was made to look up programmed instruction.

Professor Glenn Miller

Professor Miller is an Associate Professor in the School of Photographic Arts and Sciences at Rochester Institute of Technology. He teaches in the areas of color theory and perception, color printing, and color measurement. He talked about how he uses the Munsell color theory with his students.

- In response to the progress thus far (preliminary stage): he thought the ideas for the Color Strategy Project were good but may be too simplistic at this stage – i.e. students should know what the primary colors are by 6th grade.
- Suggestion was made to look up a book by Mager, *Preparing Instructional Objectives.*

Professor Clifford Wun

Professor Wun is an Assistant Professor in Foundations Studies at Rochester Institute of Technology. He discussed how he teaches color in the foundations class and reviewed the instructional tool.

- Professor Wun's background is in fine art and it is believed by this designer that he looks at color theory from a fine arts point of view.
- He explained that he uses some exercises similar to Josef Albers when teaching color. He mentioned how his students can apply what they learn in their drawings or paintings (but what about graphic communications?)
- Thought my exercises might be too easy because they tell the students to "choose primary colors to create an analogous composition" instead of letting them figure out the colors by themselves.
- Wun thought that giving them the templates to fill in the colors made it too easy but it was explained that a "controlled environment" was in fact the goal.
- He was shown an example of the Type Hierarchy Project and its success was explained and then he seemed a little more open to the idea.
- Wun thought that maybe the exercises shouldn't be given on the computer. It was explained to him that is typically the tool of choice with graphic designers and it may make the exercises more relevant to them...rather than using construction paper like Albers did. Albers said he used the construction paper because it was quick and students did not have to worry about mixing paints, etc. With this in mind, why wouldn't the computer be ideal for the same reasons? Why would paper be any harder (or easier) to use than the computer?

Peer Presentation

In the late winter quarter, there was a peer presentation to the first year graduates at Rochester Institute of Technology. This designer explained this thesis for the first time to a group of peers. The 20 minute presentation included visuals and a brief overview of the entire project thus far. Comments in response to the presentation were as follows:

- The scope and essence of the project was easily understood.
- Based on presentation, peers believed that the goals and objectives for the project would be reached.
- Praised the examples and explanation of how we learn.
- Admired the progression of simple to complex.
- Appreciated the idea of not giving the students exactly what colors to use but to make them figure it out and explore.

Professor Karen Moyer

Professor Moyer is a faculty member in the design department at Carnegie Mellon.

- An extensive phone meeting with Karen Moyer took place at which time she was asked about the color class and program at Carnegie Mellon. She said that the art program was at one time connected to the communication design program but that didn't work very well. Carnegie Mellon has a separate color class that is required for sophomores taught by Mark Mentzer and Karen Moyer. It is called Color and Communication. The catalog description of the class says: As a communication tool, color can signal, enhance, and speak in ways that type and images cannot. Combined with type and images, color can contribute to the persuasive and communicative force of design. Beginning with a perceptual understanding of color, this course will explore the many ways that color communicates. Students will work with traditional materials and tools as well as computers to understand the strengths and limitations of each, comparing their similarities and differences in the context of theoretical and applied projects. It is not a class that teaches color theory but teaches color strategies. She mentioned the projects that they do and in the sequence that they do them.
- Professor Moyer said that color theory in the real world doesn't always work.
- The Color Strategy Project was explained to her and that it will be an instructional tool that is a set of exercises (in some respects similar to her Type Hierarchy Project.) This tool will not teach them everything about color theory but it may help graphic design students become more sensitive to color and understand it better as it applies to them as graphic designers. She completely understood the essence of the project and thought it had relevance.

Professor Suzann Denny

Professor Denny Suzann Denny is Coordinator of Foundations at the State University of New York College at Buffalo.

- The Color Strategy Project was explained to Professor Denny. She was shown the Typography Hierarchy Project so she could get an understanding of the essence of the project. She liked the idea and thought that it had merit. She mentioned that the focus might be better if it were on the non-textbook idea of color theory, in that it will relate to the real world application. She also commented on the carefully picked vocabulary and thought it really worked as pertinent to graphic design. Words such as: contrast, temperature, depth issues, proximity, quantity, atmosphere, mood etc.

Professor Sue Barnes, PH D

Professor Barnes is a faculty member in the Communication Department at Rochester Institute of Technology

- The discussion with Professor Barnes focused on the communication aspect of color.
- She suggested that it be made clear who the project audience would be.
- When reviewing the preliminary thesis panels it was suggested that they be simplified, something the committee members had also suggested.

Informal Evaluation

- Informal conversations with professors, co-workers, students, friends and family members helped give an idea of how the project is perceived. On-going discussions on the thinking process and system function provided direction.

Outside Evaluation

As part of the intermediate evaluation, an evaluation packet was sent out to educators and practitioners. The Color Strategy Project evaluation packet is the outside evaluation. It was sent out on April 20, 2004 with a self addressed stamped envelope to educators and graphic design practitioners in order to receive more feedback. The evaluation packet includes a brief overview of the scope of the project, and the actual instructional tool accompanied by a student sample of a finished exercise. The evaluation form was set up on a rating system, rather than a "yes" or "no" system, in order to receive a more precise feedback. Refer to the actual evaluation packet that was sent out on pages 102 – 111 of the Appendices section.

Implementation

Final Draft

When developing the final lesson for the Color Strategy Project, it was important to:

- write the exercises so they included all important color variables that students should know
- use template outline list as a guide for final template designs
- refer to the format of the lesson plan design
- think about what might be included in the critique/discussion
- update color terminology list
- be sure that the template and exercise problem are well suited
- check and include learning and teaching objectives

Final Color Strategy Project

Students will receive a project introduction, exercise problems, templates on disk, color terminology list, semiotic diagram to be used for critique/discussion and specs for presenting final solutions.

Introduction to Project

Below is the introduction that students will receive for the Color Strategy Project. Included are the principle questions, rationale, instructional objectives, materials or resources, anticipatory set and instruction.

Introduction

Color is a powerful tool and an important part of our visual experience. It is an element of design most people will instantly recognize in a communication. As designers, the color choices we make must go beyond our own preferences, mere visual appeal or the fact that a certain color(s) worked in another project. Color can help or hinder the transmission of a message and understanding it is a vital part of developing successful graphic design communications. For many designers, color can become intuitive, but how does one get to that stage?

Project

The Color Strategy Project is not a color course nor does it attempt to teach everything about color theory. Its purpose is to get you working actively in a meaningful situation in order to become more aware of color and make thoughtful decisions when using color.

This project is a set of structured short exercises revealing the rudiments of color as they pertain to graphic design. On computer, you will explore different color variables within the same composition(s) as you gain a hands on understanding of how color can affect the transmission of a message. The ability to follow written instructions will be a skill necessary when beginning professional careers as graphic designers so it is important to read and understand the exercises.

You are encouraged not to use the same colors for each exercise. Explore colors and combinations to identify differences. Remember, there are no absolutes with color and color is relative to what surrounds it. In addition to carefully choosing your colors, think about proximity, quantity, proportion and placement. Determine what impact your color choices have on the composition. Consider all possible solutions. Be prepared to explain your results!

Guidelines

You will need to use the color terminology provided to you (see attached) throughout the course of the exercises and critiques/discussions. It is encouraged to refer to colors by their name on the color wheel. For example, blue-green will be used instead of turquoise when we speak about that hue. You will use one or more of the templates (see attached) provided to you on disk to solve each exercise.

Objectives

- students will be better able to understand color interactions through the exercises
- students will be able to recognize how intelligent use of color can affect a graphic communication
- students will build a working color vocabulary
- students will discover how specific color combinations can better communicate specific messages
- students will be able to identify how color can be used to achieve specific outcomes (contrast, dimension, temperature, atmosphere, etc.)
- students will realize the importance of proximity, quantity, proportion and placement
- students will determine what impact their color choices have on the composition regarding meaning, function and form
- students will be able to solve more complex problems by using strategies to all design whether it is for 2- or 3-dimensional, print or web, static or motion situations

Exercise Problems

Below are the exercise problems as they will be given to students.

Exercise 1

Use template 1

- Choose 2 colors to generate the illusion of advancing to the foreground and/or receding to the background.

Repeat exercise with templates 3 and 4.

Exercise 2

Use template 2

- Choose colors to form a monochromatic scheme.

Repeat exercise with template 6.

Exercise 3

Use template 1

- Choose 1 color and make it appear to be 2 different colors. You may introduce additional colors, including black, white and shades of gray, to solve the problem.

Repeat exercise with template 2.

Exercise 4

Use template 4

- Choose 2 colors to solve the 3 part exercise. You may use tints and shades of your chosen colors to solve the problem.

1 produce vibration and movement
2 produce minimum contrast and dimension
3 produce maximum contrast and dimension

Repeat exercise with templates 5 and 6.

Exercise 5

Use template 5

- Choose any variety and number of hues to create a low key or a high key composition.

Repeat exercise with template 6.

Exercise 6

Use template 7

- Choose any variety of split complementary, analogous, or triad color combinations to complete the composition. Remember, it is encouraged that you choose colors you have not used yet.

Exercise 7

Use the above completed exercise.

- Substitute your chosen colors with neutral ones – black, white, and shades of gray – for this exercise.

Exercise 8

Use template 7

- Choose any variety of hues for the composition. Use nature, your surroundings or any non-graphic communication as your inspiration for your color choices.

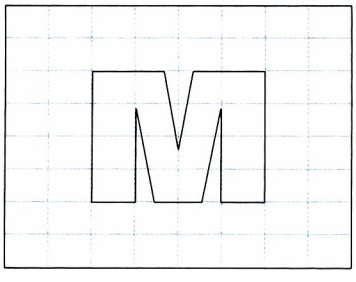
1 Bring in a picture of your inspiration to share with the class.
2 After you have completed this exercise, choose 1 word that best describes your color choices.
3 Bring your word and a typed definition to class with you and be prepared to explain your word.

Final Templates

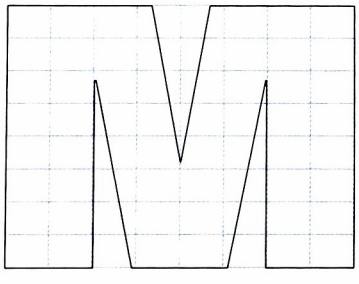
The students will use the templates provided on disk to solve each exercise problem. The templates are based on a grid composed of 16 modules. The sans serif typeface Univers 85 extra black was chosen due to its well-defined contours. It provides ample mass and is easy to read. The letter M makes a pleasing figure-ground relationship.

Simple

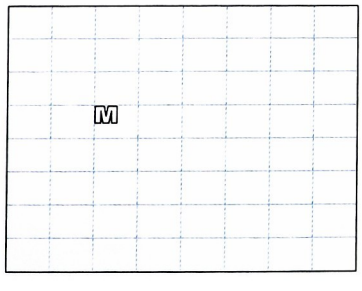
Template 1
an equal size color-field



Template 2
a large/small exaggerated color-field

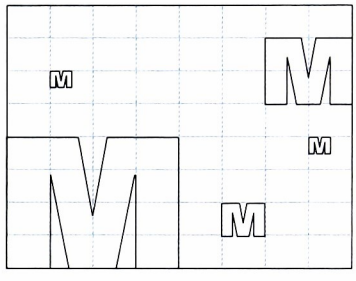


Template 3
a small/large exaggerated color-field

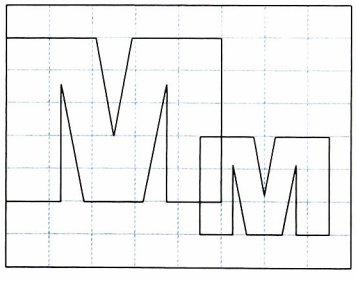


Intermediate

Template 4
combination color-field composition

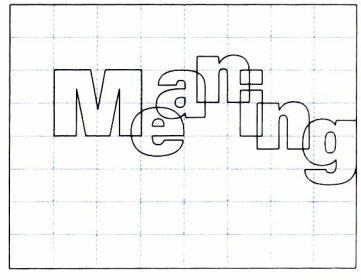


Template 5
combination color-field composition with overlap of letterforms

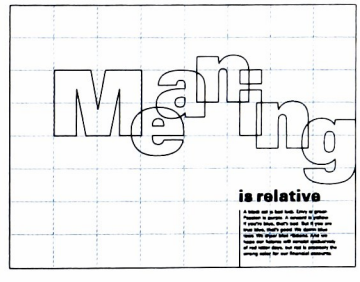


Complex

Template 6
complex color-field composition with overlap of letterforms



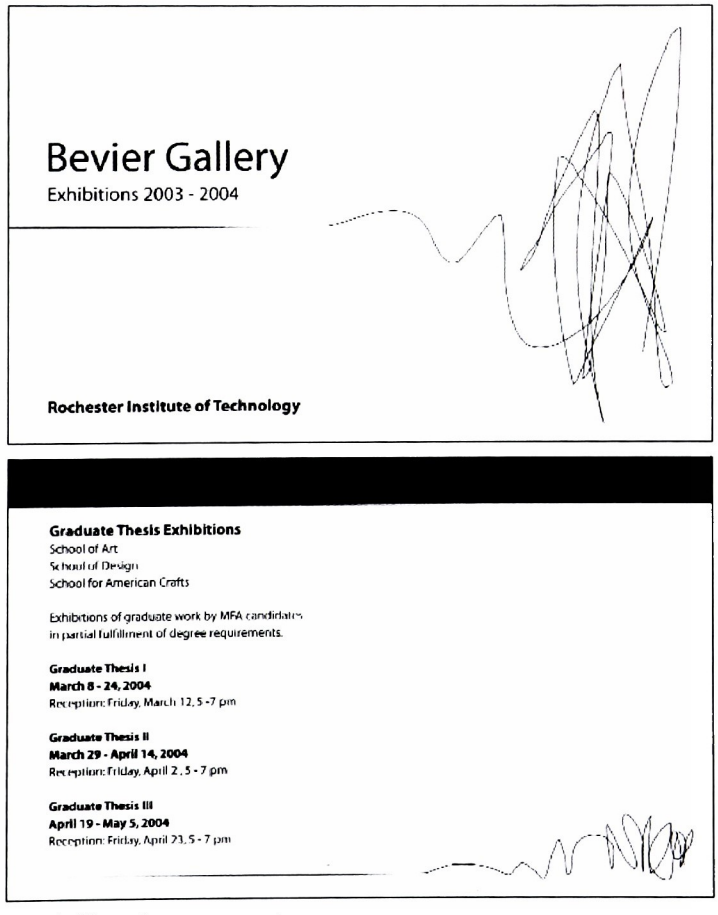
Template 7
complex and combination color-field composition with overlap of letterforms



The Color Strategy Project is a color lesson for first year graphic design college students and would be useful on the secondary level as well. It will act as an introduction for teaching color strategies to graphic design students. This project may be particularly useful for curriculums that teach graphic design students about color in a foundations class. Typically in a foundations class a student learns about many different elements of design and color is just one small part. The Color Strategy Project addresses key color strategies as they apply to graphic design. This project is direct and focused on color as it applies to graphic design. This project may be distributed to anyone interested in teaching color strategies to graphic design students. It is a printed piece in booklet form and would be distributed in that format so copies could be made to give to students. It could also be distributed on CD-ROM and users could make their own copies.

Thesis Show

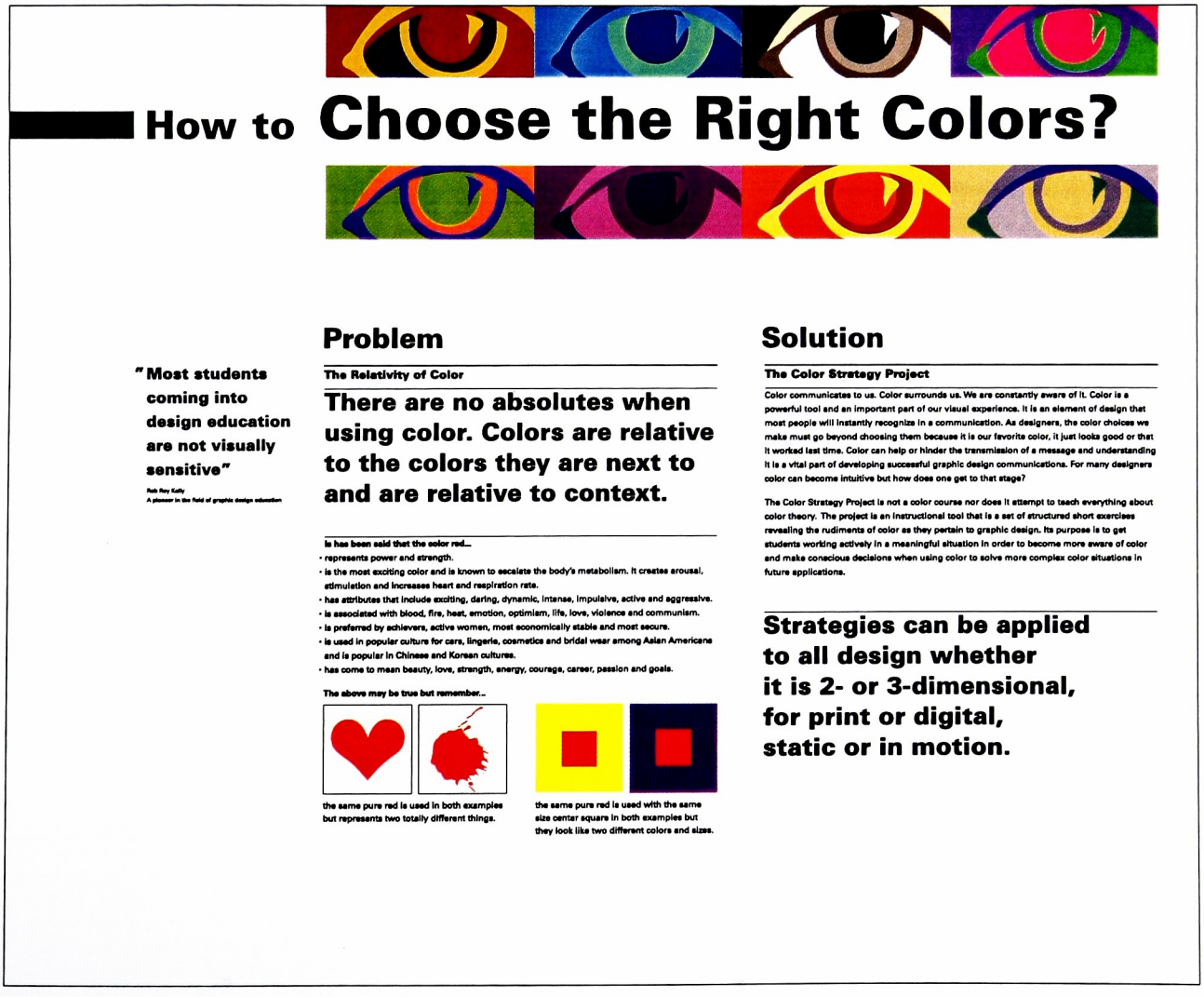
The opening for the Graduate Graphic Design Thesis Show in the Bevier Gallery at Rochester Institute of Technology was on April 2, 2004. The design of the panels and information within was well received and easily understood. Refer to the panels and gallery exhibit on pages 72–75 in the Dissemination section.



Thesis Show Announcement

Panel 1

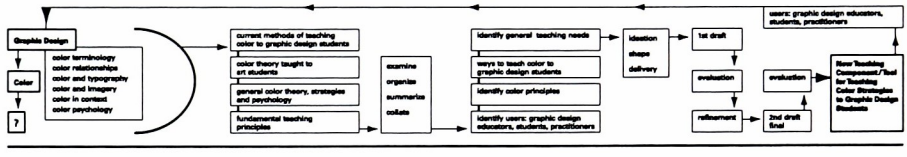
Thesis show panel 1 was designed simultaneously with panels 2 and 3 (see the following pages). Developing the system of panels this way resulted in a consistent grid structure throughout. Panel 1 served as the introductory panel for the exhibit and contained general ideas and information about color. Included at the far left is a carefully chosen quote from Rob Roy Kelly. Since he was a pioneer in the field of graphic design education and an expert on color, this served as a discerning bridge between the color information and the pedagogical information. The repeated graphic eyes at the top use different color combinations and serve as a reminder of how changing colors in a composition can change the look and feel of it. It also speaks to the headline at the top "How to Choose the Right Colors?". All the information was simplified for easier reading and straight forward language was used so it would appeal to all audiences. The size of these panels was in proportion with the templates that were developed for the color strategy project.



Panel 2

Thesis show panel 2 establishes the process of this thesis. The diagram at the top is a complete overview of the process for the thesis. Below are the carefully chosen aspects of color research that deemed to be the overarching information of the project. The pedagogical research represents the driving force behind the structure of the lesson. The information on this panel was meticulously simplified so as to follow the grid structure as much as possible. In doing so, it made it easier to read.

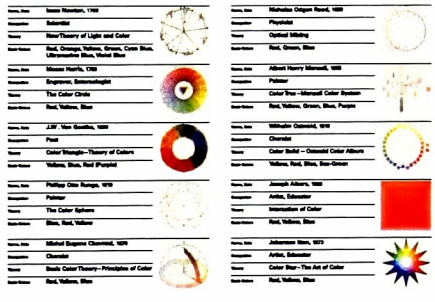
Process



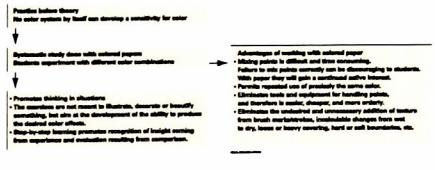
Why are there so many color theories and what do they mean?

Color Research

Color Theorists

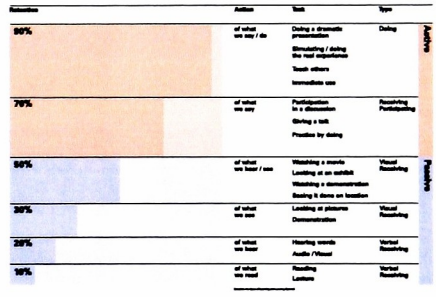


Albers Color Theory

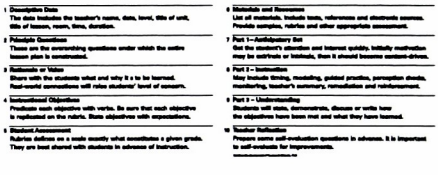


Pedagogical Research

How We Learn



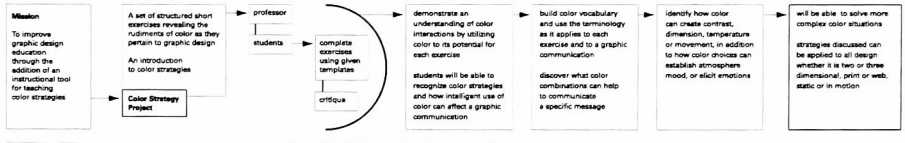
Lesson Guidelines



Panel 3

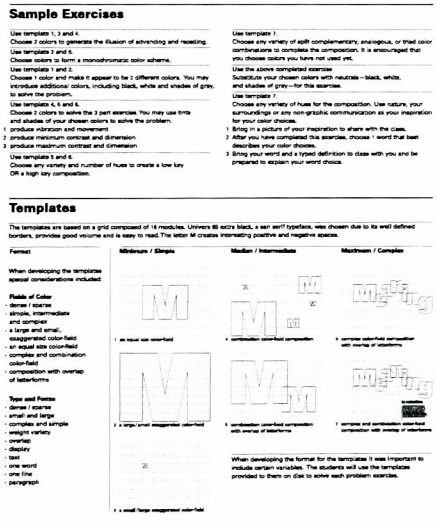
Thesis show panel 3 reveals the process of the Color Strategy Project. The diagram at the top is a complete overview of the project. Below are the tool examples where the exercise problems are found and the templates are depicted. The *student examples* present one of the exercise problems (a 3 part question) as it would hypothetically be solved by a student.

[redacted] Project

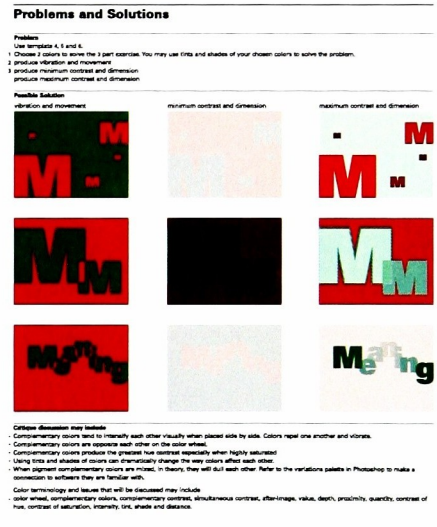


How does one become more aware of color in order to make conscious choices?

Tool Examples



Student Examples



Gallery Exhibit

Thesis exhibit in the Bevier Gallery at Rochester Institute of Technology

- Each wall panel measured 4'x 8' with a total of four wall panels provided for the display
- Each thesis display panel measured 40"x 33" with a total of three display panels

Retrospective Evaluation

This retrospective evaluation is an assessment of the final product *the Color Strategy Project.* Identifying and understanding the weak and strong aspects of the project will aid in determining how future versions of this project can be improved. This evaluation will also help establish goals for future projects.

To identify the weak and strong aspects of this project, these questions were asked:

Does the project do what it needs to do?
From educators, and from self evaluation, this designer believes the project does exactly what it set out to do and that the project objectives were met successfully. Based on the feedback from the evaluation packets sent, this thesis will be a valuable teaching aid to help graphic design students explore color through active learning exercises. This thesis makes a contribution to the graphic design field by developing a process in which color strategies are taught to graphic design students. The Color Strategy Project serves as an introduction to color strategies for graphic design students.

Do the application and the information support each other?
The application is the vehicle in which the information (color exercises) is being carried.
The information and application do support each other. Currently, the Color Strategy Project is a printed guide which is an ideal format for a lesson such as this. The Color Strategy could, however, with some modifications and/or additions be made into an interactive website or CD-ROM that students could use. This would be ideal for an online learning class or be posted on a web site (this would lend itself to a wider and less costly distribution.) A website would provided students with real-time feedback on their completed exercises. Although screen color is different than printed color, it would not decrease the effectiveness of the project exercises. In fact, Dr. Richard Zakia, one of the outside evaluators of this project, believed that the experience would be more dramatic on screen.

Does the solution meet the user and project needs?
The solution meets the needs of both the user as well as the project needs. The users are novice graphic design students and the Color Strategy Project was developed specifically for teaching fundamentals of color strategies.

How could future versions be improved?
As with any lesson plan or student project, improvements can and should be made on a continuous basis. After the project is complete or even after each exercise, a teacher reflection of preparing some self-evaluation questions for future lesson improvements is essential.

Additional Comments
From the individuals interviewed, it seems that many of those with a fine art background seem to be unsure about the validity of using the computer as a vehicle for exploring the color strategies. Based on overall feedback and research, this designer firmly believes that the computer does have its place in this project as an instrument for exploring color variables. Refer to page 27 of the Synthesis section.

Conclusion

Thesis Project

This designer received a bachelors degree in graphic design. Color theory was taught in a foundations class via the standard color wheel. Color strategies as they directly applied to graphic design (visual communication) were not addressed in lessons or projects at that time. The foundations class was taught by a professor with a background in fine art, so examples of applied color were illustrated through fine art, and color theory was discussed from a fine arts perspective.

Color theory is essential to understanding color, but knowing the 'how' and 'why' of using color in an applied situation is just as important. The Color Strategy Project developed in this thesis would have been very useful to this designer as component of the foundations class and would have provided a solid preparation for understanding color application in subsequent design classes, and for professional practice in graphic design.

The Color Strategy Project this thesis produced teaches a practical use of color. Beyond the structured exercises, students exploring color independently will foster critical thinking. Group discussions and critiques for each exercise will play an important role in reinforcing and verifying students' level of understanding color variables, terminology and strategies as applied to graphic design.

Thesis Process

The research for this thesis project was invaluable in that it allowed this designer to explore color on an entirely new and wider level. Throughout the process, pedagogical information on teaching also proved to be significant and essential for this designer as a future professor. Graphic design educator Rob Roy Kelly said "learning is not an automatic consequence of teaching." To effectively make what is personally known accessible to others, one must know what it takes to be an effective teacher. This designer believes that this thesis has been a vehicle of learning how to become a better educator. Similar to the thesis experience, education is about learning, process and progress.

Mission Statement Achieved!

The mission statement of this thesis is to improve graphic design education through the addition of an effective series of instructional exercises for teaching color strategies. Based on feedback from design educators and upon reflection, this designer believes the goals of the mission statement were successfully reached. This thesis is also applicable as a model for developing a systematic, analytical teaching/learning instrument for other graphic design projects or for other areas of study.

Glossary of Terms

Color Terminology

Additive Colors — Colors made by lights which, when mixed, create white light. (RGB)

After-image — The illusion of color and shape produced in the visual apparatus after staring at a strong color for some time. A positive after-image is the same color as the original; a negative after-image is its complement. *See Successive Contrast.*

Analogous — Neighboring colors on the color wheel– red-violet, violet, blue-violet. Colors that are closely related in hue(s). Broad use of analogous colors might encompass three or four adjacent hues with many variants in value.

Chroma — The purity of a color or its freedom from white, black or gray. The intensity of a hue.

CMYK Color — Printing technology uses a combination of Cyan, Magenta, Yellow, and Black (CMYK) inks. Colors created by the overprinting of these four colors are part of the CMYK color model. In printing, a technique for reproducing colored images by separating them into the primaries magenta, cyan. yellow, and black (CMYK) and printing each color from a separate plate. CMY are subtractive colors and black is not one of the primary subtractive colors. Black is added to enhance the contrast of colors.

Color Separations — In printing, colored images are separated into screens of certain primaries (in a four- color process, they are magenta, cyan, yellow, and black) which when superimposed, and printed, will yield an approximation of the original colors.

Color Theory — The study of color; a set of statements or principles devised to explain color.

Color Wheel — A circular, two dimensional model showing color relationships, originating from Sir Isaac Newton's bending of the straight array of spectral hues into a circle.

Complementary Colors — Colors opposite each other on the color wheel: red and green, orange and blue, yellow and violet. When pure hues are placed side by side, they intensify each other visually. True complimentary colors, when mixed, produce a neutral color.

Complementary Contrast — They refer to the juxtaposition of diametrically opposed colors on the chromatic circle. Such contrasts contribute to the fundamental and natural balance of chromatic composition.

Cool Colors — Colors from the blue and green side of the color wheel (greens, blues and violets). Cool colors generally recede and contract. *See Warm colors.*

Diad — Using two colors that are neighboring on the color wheel. Example: red and orange.

Double Complementary — A color combination in which hues adjacent to each other on the color wheel are used with their respective complementaries. *See Split Complimentary.*

Four-color Process — In printing, a technique for reproducing colored images by separating them into the primaries magenta, cyan. yellow, and black (CMYK) and printing each color from a separate plate. *See Color Separation and CMYK.*

HSB — Hue, saturation, and brightness–the variables in color specified in television technologies.

High/Low Color Key The overall brightness and chroma (color saturation). High key color is the light end of the value scale. Low key color is on the darker end of the value scale. High and low key colors can have varying levels of color saturation. A composition in light values is termed a high key, while one of dark values is called low key. The image condition can be examined using the histogram or level compensation functions in image editing software.

High Key Composition Compositions that are distinguished by their overall brightness, in which light predominates over dark.

Hue This is the most characteristic dimension which identifies a color by name, i.e. red, yellow, blue, blue green etc. Every color falls into a definite hue category when related to the spectrum range of colors.

Light-dark Contrast Light-dark contrast is produced by the juxtaposition of a pale and dark color or a clear and dark color.

Limited Palette The use of relatively few colors in a composition.

Local Color The color sensation received from a nearby object under average lighting conditions.

Low Key Composition Compositions that are distinguished by their overall darkness, in which dark predominates over light.

Luminance The degree of lightness or darkness in light mixtures, corresponding to value in pigments.

Monochromatic Tints and shades of the same color–pink, red, maroon. Referring to a color combination based on variations in value and saturation of a single hue.

Neutral Black, white, or gray or a color mixed with its compliment.

Open Palette The use of a wide range of colors in a work of art.

Pigment Powdered coloring material used to give hues to paints.

Primary Colors Those hues from which all others can theoretically be mixed; in refracted colors, red, green, and blue; in reflected colors, red, yellow, and blue. The three pigment primary colors are red, yellow and blue–from which all other colors are produced. A fundamental color that cannot be separated into any other colors. When primaries are mixed, they can produce all the remaining colors.

Pure Color Contrast Pure color contrasts results from the juxtaposition of saturated colors that are clearly different. These contrasts are peak when the three primary colors are juxtaposed to one another.

Quality Contrast Quality contrasty is the result of juxtaposing saturated and unsaturated colors, or bright and a grey-tinted colors (to which grey or a complementary color was added). This contrast exists only if unsaturated colors are considerably dominant.

Quantity Contrast Quantity contrast is the result of the juxtaposition of little and much, small and large. The surface devoted to each color influences their impact on compositions.

RGB Color Physicists have determined that white light is composed of wavelengths of red, green and blue. Computer monitors create colors by emitting red, green and blue beams of light; They use the RGB color model. The additive primaries used in color computer monitors and color televisions.

Saturation The relative purity of a color. The relative brightness or dullness of a color, also called chroma or intensity. Highly saturated colors appear closer than colors of low saturation.

Screen Printing A dot pattern used to create the impression of a certain value.

Secondary Colors A color produced by a mixture of two primary colors–orange, violet and green.

Shade Any color with black added.

Simultaneous Contrast In general, the optical effect of adjacent colors on each other; more specifically, the tendency of complementary colors to intensify each other when placed side by side. They flow from the juxtaposition of two colors that are not exactly complementary. In such cases, colors seem to repel one another and vibrate as the eye tries to bring them closer to their precise complementary colors.

Spectral Hues Those colors seen in a rainbow, or in the spectrum created when white light passes through a prism.

Split Complements Choosing one color and using the color on each side of its complement on the color wheel. A color combination whereby a hue is used with the hues lying to either side of its direct complementary. *See Double Complementary.*

Spot Color Printing technology refers to these colors from the pantone book, for example. These colors are opaque compared to CMYK colors which are transparent.

Subtractive Color Mixing Combination of pigments, which result in darkened mixtures.

Temperature Contrast Warm and cool colors work together to create a sense of movement: warm colors generally advance while cool colors recede. *See Cool Color and Warm Color.*

Tertiary Color resulting from the mixture of a primary and secondary color, characterized by the neutralization on intensity and hue.

Tint Any color with white added.

Tone Color variety due to slight changes within the same hue.

Transparency Effect The painted illustration that one film of color is lying over another color.

Triadic Colors Color scheme that has three colors equally spaced from each other. Example: the three primary colors red, yellow and blue.

Value The characteristic of color determined by light or dark, or the quantity of light reflected by the color. The degree of lightness or darkness in a color.

Visible Spectrum The range of wavelengths seen by the human eye.

Warm Colors Colors from the red and yellow side of the color wheel (reds, oranges and yellows). Warm colors generally advance and expand.

Warm-cold Contrast They result from the juxtaposition of warm and cold colors, which makes warm hues appear warmer, and vice versa.

Wavelength The distance from crest to crest in a wave of energy.

Web-Safe Colors Currently, there are actually only 216 colors that won't ever dither on browsers on 8-bit monitors on either platform (MAC or Windows).

Pedagogical Terminology

Cone of Learning	Edgar Dale's *Cone of Learning* suggests that activities that are more active and participatory help us remember what we learn more successfully.
Learning Pyramid	Developed by the National Training Laboratories in Bethel, Maine. The pyramid shows retention rates from different ways people are taught.
Multiple Intelligences	Developed by Howard Gardner, Harvard psychologist. This theory suggests that people acquire knowledge and learn and understand differently.
Performance-based Education	Based on the premise that learning needs to be connected to the lives of the students through relevant tasks that focus on students' ability to use their knowledge and skills in meaningful ways.
Programmed Instruction	Is a method of presenting new subject matter to students in a graded sequence of controlled steps. Students work individually through the programmed material at their own speed, and after each step, test their comprehension by answering an examination question or completing a diagram.
Rubrics	Performance-based assessments that evaluate student performance on any given task or set of tasks that ultimately leads to a final product, or learning outcome.

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Josef Albers believed that color is the most relative medium in art. Color theory is important but theory in practice does not always work. One must always be aware of that. This quote was the precedent for the development of the templates for the Color Strategy Project:

"Usually, illustrations of harmonic color constellations which derived from authoritative systems look pleasant, beautiful, and thus convincing. But it should not be overlooked that they are usually presented in a most theoretical and least practical manner, because normally all harmony members appear in the same quantity and the same shape, as well as in the same number (just once) and sometimes even in similar light intensity.

When applied in practice, these harmony sets appear changed. In addition to quantity, form, and recurrence, wider aspects exert still more changing influences. These are changed and changing light–and even worse, several simultaneous lights; reflections of lights and of colors; direction and sequence of reading; presentation in varying materials; constant or altering juxtaposition of related and unrelated objects. With these and other visual displacements, it should not be a surprise that the sympathetic effect of the original ideal color combinations often appears changed, lost and reversed.

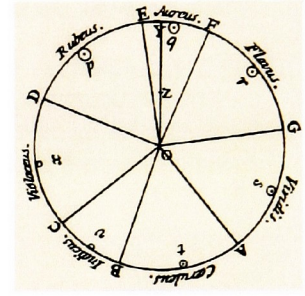
Good painting, good coloring, is comparable to good cooking. Even a good cooking recipe demands tasting and repeated tasting while it is being followed.

And the best tasting still depends on a cook with taste."

The following 6 pages is color research that was gathered from numerous resources and was not wholly written by this designer. This valuable information is meant for research and informational purposes only. Some of the illustrations in this section are actual drawings of the theorist and some are a copyright of Echo Productions.

Isaac Newton

1642–1726
The famous circular arrangement of spectral colors appeared in 1704 in his central work Opticks.



Country — England

Basic Colors — Red, orange, yellow, green, cyan blue, ultramarine blue, violet blue

Form — Circle

Application — Physics

Related Systems — Grosseteste, Alberti, da Vinci, Aguilonius, Kircher, Waller, Mayer, Harris, Schiffermüller, Sowerby, Goethe, Field, Maxwell, Helmholtz, Wundt

Summary — After Newton had used a prism to separate daylight and count seven individual colors, it appeared to him that, when considering color-hue, this was a closed system. By taking the violet end of the spectrum and linking it to the red start-point, he created a convincing circle of colors. With Newton's circular shape, the transition between the 1- and 2-dimensional color-system is complete. It is helpful to realize that although this step was made by a physicist, it actually has little to do with physics; it is our brain that, out of the straight line of physics, makes the circle first drawn by Newton.

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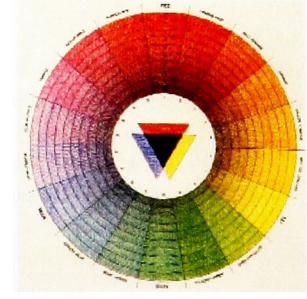
Moses Harris

1731–1785
The engraver and entomologist introduced *The Natural System of Colors* between 1766 and 1770.



Country — England

Basic Colors — Red, yellow and blue

Form — Circle

Related Systems	Newton, Sowerby, Hayter, Birren
Summary	The system comprises two circles which are intended to demonstrate how the other colors can be created out of red, yellow and blue. The so-called "prismatic" circle commences with the aforesaid primary colors. The resultant intermediate colors are taken as the basis for a second circle of mixed "compound" colors. At the centre of his circle, Harris demonstrates what we now know as the subtractive mixing of colors, with his most important observation showing that black will be formed through the superimposition of the three basic colors: red, yellow and blue.
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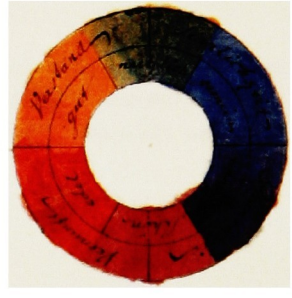
J.W. von Goethe

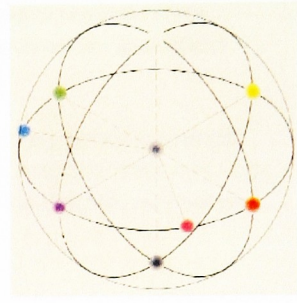
1749–1832
The problem of colors had occupied Goethe from 1791. His work *Theory of Colors* appeared in 1810.



Country	Germany
Basic Colors	Yellow, blue and red [purple]
Form	Circle
Related Systems	Aguilonius, Waller, Newton, Runge, Chevreul, Bezold
Summary	Goethe presented a circular diagram in which the three primary colors of red, blue and yellow alternate with the three secondary colors of orange, violet and green. Red occupies the highest place in the circle, and green the lowest. The semi-circle from green, through yellow to red is known as the plus side; its opposite is the minus-side (Original drawing of Goethe). Goethe sought to surpass Newton's system. With his insight into the sensual-moral effect of colors, Goethe comes nearer to his initial objective: namely, to bring order to the more chaotic, aesthetic aspects of colour. He places coloration within the separate categories of "powerful", "gentle" and "radiant" and, accordingly, sets down his concept. Goethe's worked later inspired the great color theorist, Josef Albers.
Bibliography	J. W. von Goethe, *Theory of Colors*, Tübingen 1810; J. W. von Goethe, Geschichte der Farbenlehre, parts I and II, Munich 1963; J. W. von Goethe, *Theory of Colors*, didactic volume, Munich 1963; W. Heisenberg, Die Goethesche und die Newtonsche Farbenlehre im Lichte der modernen Physik in Gesammelte Werke, Volume CI, Munich 1984, pp 146–160; John Gage, *Colour and Culture, Practice and Meaning from Antiquity to Abstraction*, Thames and Hudson, 1993, pp 201–205; www.colorsystem.com

Philipp Otto Runge

1777–1810
The painter Runge introduced his spherical construction in 1810 after eight years work with colors.



Country: Germany

Basic Colors: Blue, red and yellow

Form: Sphere

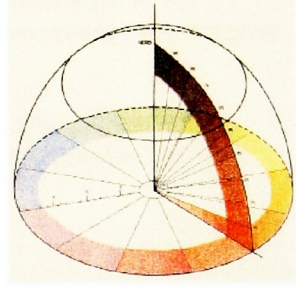
Related Systems: Lambert, Goethe, Benson

Summary: The color-sphere has the pure colors around the equator, starting with the three primary colors of red, yellow and blue. Three mixed colors take their place in each of the equal intermediate spaces between the primaries, while white and black form the sphere's poles. Runge wished to capture the harmony of colors–not the proportions of mixtures. He wished to bring a sense order to the totality of all possible colors, and sought an ideal colour-solid.

Bibliography: Ph. O. Runge, *Farbenkugel*, Hamburg 1810; J. Pawlik, *Theorie der Farbe*, Cologne, 1976; H. Matile, *Die Farbenlehre Phillip Otto Runges*, 2nd edition, Munich 1979; John Gage, *Colour and Culture, Practice and Meaning from Antiquity to Abstraction*, Thames and Hudson, 1993, p 221. Catalogue, Runge Centre, Wolgast, Germany; www.colorsystem.com

Michel Eugène Chevreul

1786–1889
The chemist Michel Eugène Chevreul introduced his (incomplete) attempt at producing a systematic approach to seeing colors in 1839.



Country: France

Basic Colors: Red, yellow and blue

Form: Hemisphere, circle

Application: Organization of colors for the manufacture of textiles.

Related Systems: Field, Benson, Bezold, Wundt, Blanc

Summary: The purpose of the system is to establish a law of "Simultaneous Contrast." Leonardo da Vinci had probably been the first to notice that, when observed adjacently, colors will influence each other. Goethe, however, was the first to specifically draw attention to these associated contrasts. Chevreul designed a 72-part color-circle whose radii, in addition to the three primaries of red, yellow and blue, depict three secondary mixtures of orange, green and violet as well as six further secondary mixtures. The resultant sectors were each subdivided into five zones and all radii were separated into 20 segments to accommodate the different brightness levels.

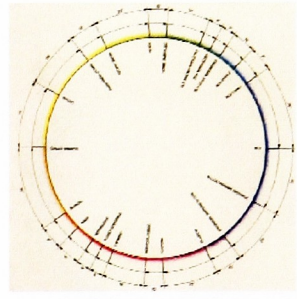
This is the first time that we have been confronted with the active role of the brain in the formation of colors, and we should once more remind ourselves that colors are also effects which are created in the world inside our heads.

Bibliography

M. E. Chevreul, *De la loi du contraste simultané des couleurs et de l'assortiment des object colorés*, Paris 1839; A. Hope und M. Walsh, *The Color Compendium*, New York 1990; John Gage, *Colour and Culture, Practice and Meaning from Antiquity to Abstraction*, Thames and Hudson, 1993, pp 173–176. www.colorsystem.com

Nicholas Odgen Rood

1831–1902
In 1879, the American physicist Nicolas Odgen Rood published his research and findings on physiological optics.



Country

USA

Basic Colors

Red, green and blue

Form

Circle

Related Systems

Maxwell, Munsell

Summary

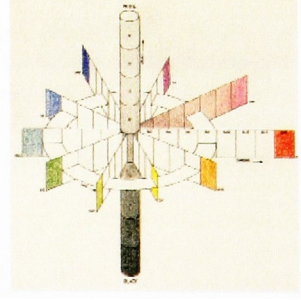
His interest in colors encompassed the scientific and artistic points of view, and both these aspects underlay his attempts to impose a systematic order on colors. In addition to a double cone with a black and a white tip, Rood produced a "scientific" color-circle which he had constructed on the basis of experiments using rotating discs, a color-point being placed precisely opposite its complementary partner.

Bibliography

N. O. Rood, *Modern Chromatics with Application to Art and Industry*, Chicago 1879; F. Birren, *Principles of Color*, New York 1969; A. Hope und M. Walsh, *The Color Compendium*, New York 1990. www.colorsystem.com

Albert Henry Munsell

1858–1918
One of the most widespread–and nowadays most utilized–color-systems, this system was developed by the American painter Charles Munsell between 1905 and 1916.



Country

USA

Basic Colors

Red, yellow, green, blue and purple

Form

Colour-tree

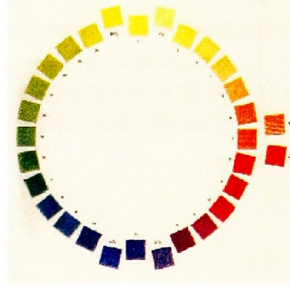
Related Systems

Bezold, Rood, Ostwald, CIE, CIE-Rösch, Johansson, DIN, ISSC-NBS, OSA, NCS, Coloroid, HLS

Summary	This system is based on the principle of "perceived equi-distance"–to use the correct, although rather long-winded technical term. Munsell attempts to account for each colour attribute in ordered visual steps. He introduces 100 steps for color "hue", starting with five main colors and five additional colors, and adopts an ordering system with 10 units of colour "value" and an open scale called "chroma" (similar to saturation). The resultant three-dimensional system can best be portrayed as a "color-tree".
Bibliography	H. Munsell, *A Color Notation*, Boston 1905; A. H. Munsell, *The Atlas of the Munsell Color System*, Boston 1915; F. W. Billmeyer Jr., *Survey of Color Order Systems, Color Research and Application* 12, pp 173–186 (1987); www.colorsystem.com

Wilhelm Ostwald

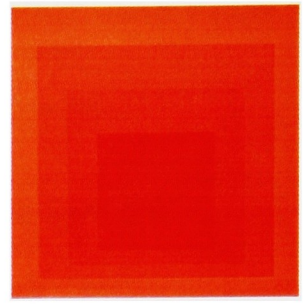
1853–1932
Wilhelm Ostwald, the Nobel-prize winner for chemistry, compiled his *Die Farbenfibel (The Colour Primer)* in 1916/17 in the hope of developing a better understanding of their perceived harmonies.



Country	Germany
Basic Colors	Yellow, red, blue and sea-green
Form	Circle
Related Systems	Bezold, Wundt, Hering, Pope, CIE, Luther & Nyberg, Müller I, DIN, Müller II, NCS
Summary	Ostwald wanted to achieve harmony with colors. Experience had shown him (and others) that some color combinations could be seen as pleasant (or harmonious), while others were unpleasant. The question was why, and whether a law could be formulated. With his analysis of color-harmony, Ostwald proceeds on the basis of his conviction that harmony is created by color-order. A double-cone is put forward with one white and one black tip between which a stepped grey-scale is arranged, modeled according to a fundamental psychological law. The double-cone extends from a color-circle divided into 24 segments (the full colors) which in turn stem from the four proto-colors of yellow, red, blue and sea-green.
Bibliography	W. Ostwald, *Die Farbenfibel*, Leipzig 1916; W. Ostwald, Der Farbatlas, Leipzig 1917; F. Birren, *The Principles of Color*, New York 1969; H. Hönl, Die Ostwaldsche Systematik der Pigmentfarben in ihrem Verhältnis zur Young-Helmholtzschen Dreikomponenten-Theorie, Naturwissenschaften 21, pp 487–494 and Naturwissenschaften 22, pp 520–524 (1954); John Gage, *Colour and Culture, Practice and Meaning from Antiquity to Abstraction*, Thames and Hudson, 1993, pp 247–250 and 257–260; www.colorsystem.com

Josef Albers

1888–1976



In his Homage to the Square series, Josef Albers used the same format for his experiments to show optical effects of specific color combinations. These experiments lasted for 25 years.

Country: German/American Immigrant

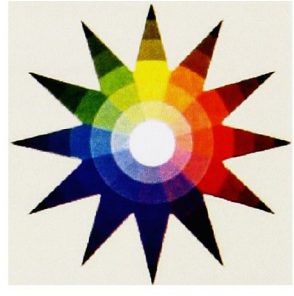
Basic Colors: Red, yellow and blue

Summary: Albers students learned by doing – the emphasis was on experiencing the different interactions by doing studies with color and material. Rob Roy Kelly said about Josef Albers..."what I appreciated most about Albers' approach to color was the lack of rigidity and his understanding of the relativity of color. The first thing he did in color class was to ask every student to go through the color pack, pick out red and lay it face down on the desk. After a few minutes, Albers asked the students to hold up red. The variation among students as to what they thought was red proved to be quite amazing. This provided a basis for Albers to address students about color relativity and how no two people see color exactly the same." Josef Albers believes that color is the most relative medium in art.

Bibliography: Albers, Joseph. *Interaction of Color.* New Haven, CT: Yale University Press, 1987, http://www.user.com/albers.htm; www.rit.edu/~rkelly/html/index2.html

Johannes Itten

1888–1967



In the mid 1900s, Johannes Itten developed a new kind of color wheel that changed the way color was seen, influencing artists and designers right up to the present moment.

Country: Switzerland

Basic Colors: Red, yellow and blue

Form: Star

Summary: The Bauhaus in Weimar, Germany was home to many artists whose influence is still felt today in the worlds of art and design. It was there that Itten developed his book, *The Art of Color,* which was the definitive compilation of what was taught in the Basic Course which Itten oversaw, at the Bauhaus. Itten's color wheel took into consideration the subjective feeling that's associated with objective color, and the psychic and emotional values of colors. Today, we're used to saying that "blue is cold" for example; each time we do, we should perhaps credit Itten and his color theory. "Color is life, for a world without color seems dead" he wrote.

Bibliography: Itten, Johannes. *The Art of Color; The Subjective Experience and Objective Rationale of Color.* NY: Reinhold Publishing, 1961. http://www.dezignare.com/newsletter/JohannesItten.html

Numerous sources contributed to this section. This information has its merits, however it should be viewed with caution. One must remember that color is relative to context.

Bourges, Jean. Color Bytes: Blending the Art and Science of Color. Forest Hills, NY: Chromatics Press, 1997.

Color Matters. www.colormatters.com, January 16, 2004.

Eiseman, Leatrice. *Pantone Guide to Communicating with Color.* Design Books, 2000.

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Paul, Pamela. "Color by Numbers", *American Demographics* 24 no2, 30-5 F, 2002.

Red

- Red is the most exciting color and is known to escalate the body's metabolism.
- Dark red has anger implications; it indicates high energy, determination, and passion.
- The color red has been part of the English language since about A.D. 900.
- Its name is used for shades ranging from very bright, bold red, to reddish yellow or reddish brown.
- Found not only in the lores of ancient medicine but in the superstitions of modern times, red has been viewed as the vigorous color of health. Red wool was applied to relieve sprains in Scotland, sore throats in Ireland, and to prevent fevers in Macedonia.
- The ruby, a precious gemstone with a brilliant red color, was worn in China to promote long life.
- The color red has also been a representation of love within a relationship between two people. A red rose, has always been known as a symbol of love, as well as the ever-popular red heart on Valentine's Day.
- Red has come to mean beauty, love, strength, energy, courage, career, goals, power, and will power.

Attributes: Exciting, daring, dynamic, intense, impulsive, active, aggressive and passionate
Associations: Blood, fire, competition, heat, emotion, optimism, life, love, violence and communism
Effects: Arousal, stimulation, increases heart and respiration rate
Preferred by: Achievers, high-powered individuals, active women, most economically stable and most secure
Used in popular culture for: Cars, lingerie, cosmetics, bridal wear among Asian Americans–red is popular in Chinese and Korean cultures too.

Orange

- Orange is the only color of the spectrum whose name was taken from an object, the fruit called the orange. The fruit comes from an evergreen tree, citrus aurantius, and the word "orange", comes from the old French orange. Since about 1300 orange has used as part of the English language.
- Because the orange tree is evergreen and ever-bearing, the color orange became associated with fruitfulness.
- In folklore the color orange stands for fire and flames, lust, vigor, excitement, adventure and wholesomeness.
- Orange also has meaning for success, stimulating energy justice, attraction and endurance.

Attributes: Vibrant and warm
Associated with: Extroversion, adventure and celebration
Effects: Stimulating but less than red and triggers alert
Preferred by: Influentials, adolescents, bright orange is second least favorite color overall
Used in popular culture for: Safety color – to alert our attention. Not for full-blown danger, but potential danger.

Yellow

- Yellow is cheerful. Dark yellow can be oppressive while light yellow is breezy.
- Since about A.D. 900 the color yellow has been integrated into the English language, stemming from closely related words in the Latin and various Germanic languages. In history, where it is called for (for gold) the color yellow stands for the positive virtues of faith, constancy, wisdom, and glory.
- Yellow is a a color that represents playfulness, light, creativity, warmth, mental powers, charm, confidence, vision, joy, enthusiasm, optimism, and an easy going attitude about life.
- The color yellow also has many negative associations as well, among them are jealousy, treachery, cowardice, aging, and illness.

Attributes: The warmest color, cheerful and happy.
Associations: Sunshine, creativity, imagination, optimism, futuristic, spirituality, newness and low prices.
Effects: Warming and cheering.
Preferred by: The first color kids reach for, yet the least preferred color overall.
Used in popular culture for: The lead color projected for women's, men's, children's and home use through 2004.
Yellow also represents: Envy, treachery, cowardice. A yellow flag on a ship signifies contagious disease. In the Western world, yellow is the symbol of a certain type of sensation seeking, and destructive yellow journalism, because the most vicious kind of news was printed on colored (yellow) paper to incite the curiosity of the public.

Green

- Green is peaceful, the color of a spring meadow. Bright green can be uplifting and dark green evokes the mental image of a grove or forest. Green is the color of freshness and renewal, and has been in Western culture since the earliest of times.
- The word "green" comes from the old English gréne, in turn from grêne in old Frisian and various related Germanic languages.
- Green has come to mean youth, growing, healing, success, good luck, and beauty.
- In the 15th Century, the color green was the best choice for the bride's gown because of its earliest symbolism, fertility. Green was a sacred color to the Egyptians representing the hope and joy of spring. Green is a sacred color to Muslems.
- It is said that green is the most restful color for the human eye. Green has great healing power. It can soothe pain. People who work in green environments have fewer stomachaches. Suicides dropped 34% when London's Blackfriar Bridge was painted green.
- Green represents harmony, growth, abundance, vitality, healing, nature and radiates a feeling of fullness.

Attributes: Fresh, clean and restful.
Associations: Ecology, nature, balance, envy, fertility and spring.
Effects: Stabilizing, nurturing, healing, and revitalizing.
Preferred by: Popular among influentials, opinion leaders, trendsetters. "Slime green" is preferred by youths and number 2 favorite.
Used in popular culture for: Higher-end vehicles (rich, dark hunter green), in interiors popular for bedrooms (to compensate for lack of natural light/outdoors) and natural foods.
Green also represents: Poison, because arsenic, known in ancient times, is green, and so are many poisonous sulphates. In more recent times, many poisons were manufactured in green powder form, in order to differentiate them from flour or sugar. Green also symbolizes jealousy, and fear, both of them deadly poisonous emotions.

Blue

- Blue is the most calming color. It is considered to be the second most powerful color after red. Blue is the color of constancy and faith.
- The soothing color blue stands for sky, good health from air, sensitivity, truth, sleep, healing, hope, friendship, protection, calm, creativity, patience, wisdom, peace, loyalty and ones desire to nurture.
- The word "blue", from middle English blew and old English blaw, has been used since about 1300 to describe a color of the spectrum.
- In the symbolism of history blue is called azure and signifies piety and sincerity.
- Around the twentieth century it became a symbolic representation of the male gender.
- Dark blue, is the color that indicates dignity, tranquility, higher intuition, psychic powers, and trustworthiness. It is as calming and shares many traits with blue but being darker the affect is more intense and powerful.
- Blue stands for sky, heaven, and water, healing and calmness.

Attributes
Calm, tranquil and holy

Associations
Constancy, dependability, water, sky, holiness, protection, purity, peace, trust, loyalty, patience, hope, perseverance, sadness and depression, and the future.

Effects
Calming, cleansing and cooling.

Preferred by
Number 1 favorite color in America.

Used in popular culture for
Number 1 for casual clothing, number 2 for business clothing, not for most rooms, especially not a dining room.

Purple

- Purple or violet is the color of royalty but rare in nature and perceived as artificial.
- A combination of red and blue, purple is a color that has been associated with royalty since ancient Roman times.
- The color purple is symbolic of power, spiritual goals, passionate belief, visionary leadership, respect and wealth and has been worn by emperors, military commanders, and other high-ranking officials. It also has come to symbolize psychic ability, success, wisdom ,power, spiritual growth, and independence.
- Lavender has come to mean reverence and royalty. It is also a fashion favorite while dark purple implies wealth.
- The word "purple" comes from the Greek porphura, a species of shellfish that yielded, through an elaborate process, the dye called Tyrian purple. Very expensive to produce, it was reserved for special cloth and garments, such as those of kings.

Attributes
Exciting, mysterious, complex and intriguing.

Associations
Passion, spirituality, art, creativity, wit, sensitivity, vanity, moodiness, royalty, superiority and richness.

Effects
Inspiring, thought provoking and polarizing.

Preferred by
Number 3 favorite, popular among 18–29 year olds, artists, more androgenous than other colors, and loved or hated more than any other color.

Used in popular culture for
Interiors or for clothing. Americans have gone back to purple in times of war.

Based on information prepared by Dr. Lapardi, Canisius College 2002

Visual Learning

You have to see it to believe it

- Needs to see it to know it
- Strong sense of color
- May have artistic ability
- Difficulty with spoken directions
- Over-reaction to sounds
- Trouble following lectures
- Misinterpretation of words

Auditory Learning

If you hear it, you remember it

- Prefers to get information by listening–needs to hear it to know it
- Difficulty following written directions
- Difficulty with reading and writing

Kinesthetic Learning

If you can touch it with your hands, you will remember it

- Prefers hands-on learning
- Can assemble parts without reading directions
- Difficulty sitting still
- Learns better when physical activity is involved
- May be very well coordinated and have athletic ability

General Teaching Philosophies

Marzano, Pickering, Pollock. Classroom Instruction that Works. ASCD, 2001.

Positive Attitude

In order to effectively teach, educators must possess positive attitudes; must have a high degree of enthusiasm towards the students as well as the subject matter. Teachers should display a strong sense of caring towards students and the information being taught. A sense of high expectations towards students' work and learning, in general, will promote student motivation towards learning and achieving. Students in productive learning environments will accept responsibility for their own learning.

Organization

Effective teachers need to use their time wisely in order to increase students' chances for learning. Less time should be spent on non-instructional activities and more time should be focused where students are constantly engaged in learning. Highly organized teachers will start their teaching on time by preparing all the materials they will use in a lesson ahead of time. Organization will make the job easier and run more smoothly, therefore they are more likely to enjoy their job. At all levels, teachers need to establish routines in their classrooms and with their students. Routines give students a sense of predictability and order so that effective learning can take place.

Management

Even on the level of higher learning, classroom management, including procedures and rules, are important. A cognitive approach to classroom management relies on students' understanding of the reasons for the rules and procedures as opposed to following them because they exist. Students are more likely to abide by the rules when they understand the reasons for the rules. This promotes self understanding by the students in relation to the rules. The backbone to an effective management system is a well planned and implemented set of rules established the first day. Teachers need to state rules clearly and establish student boundaries. Students in higher learning are more likely to question authority. Students need the emotional security that teachers truly care about them as individuals and are interested in what and how they are learning. Procedures tell students what routine to follow and give them a framework to work within. Teachers should state classroom rules in a positive manner as to specify to students desired behavior. Finally, teachers need to keep the list of rules short so students do not get over-whelmed and, therefore, ignore them. Student expectations should be stated from the first day of class. Teachers must constantly practice follow-through in the upkeep of an established classroom management system. Students have to be reminded that the teacher is committed to the management system and will not tolerate any deviation from the established classroom rules and procedures.

Informal questions asked to those who teach color theory and/or strategies

Do you think an entire course on color theory should be required for all graphic design students? Why or why not?

When you were a student, how or in what class did you learn about color theory?

In what class do the students in your program learn about color theory? How much do they know about color when they come to your class?

How much time do you spend on teaching color theory to students?

What methods do you use to teach color theory? For example, color wheel project along with key terminology.

Is there any particular color theory you teach?

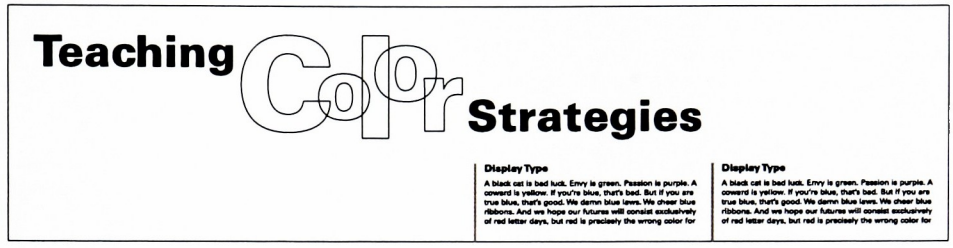
Do you think students struggle with color? What do you think is their biggest struggle?

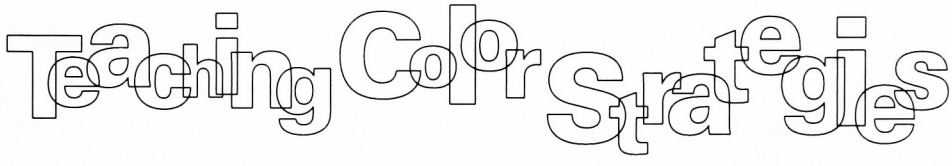
What are some common mistakes students make when it comes to color theory or using color?

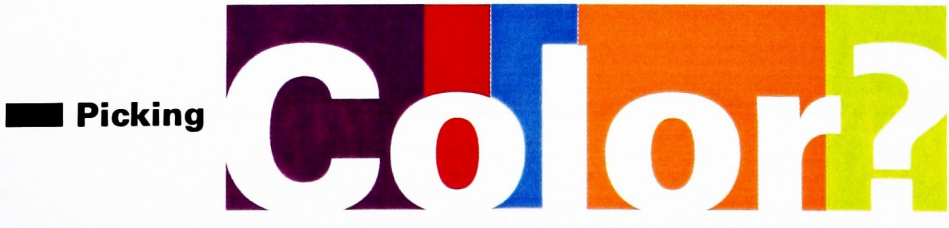
What are the most important things students should learn about color theory and how can they apply those ideas into a graphic communication? (Terminology? How colors are produced?)

Thesis Panel Comps

Below are sample comps for the first thesis panel.

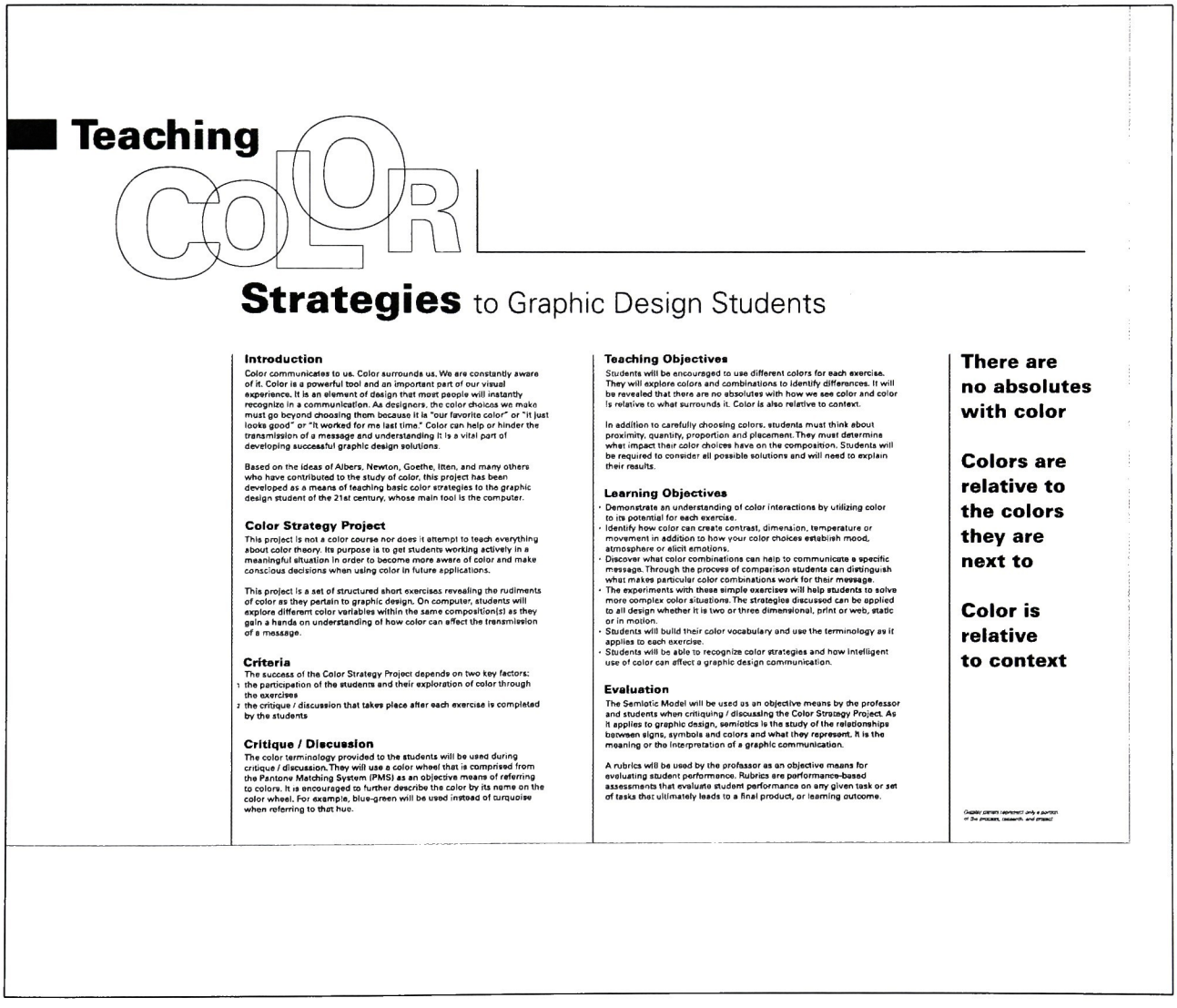






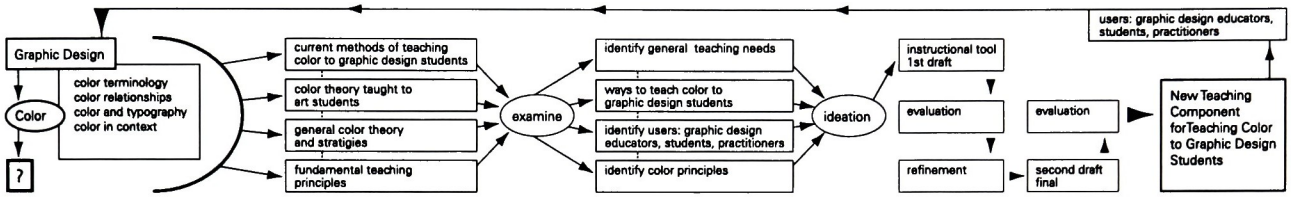
Thesis Panel Comps

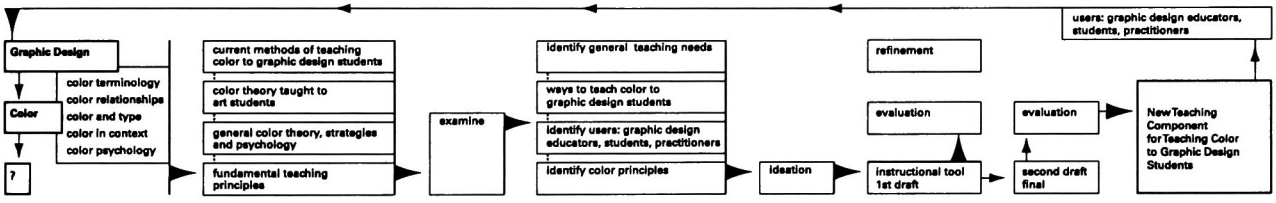
Below is one sample comp for the first thesis panel. The information was overwhelming for an exhibit, so it was modified and simplified.



Thesis Panel Comps

Below are sample comps for the second and third thesis panels. These were some ideas for the project explanatory diagrams.





The following 14 pages are the evaluation packet that was sent to these individuals and the evaluations that were returned:

Evaluators

Katie Fagan, Associate Professor, Portland College of Art

Richard Zakia, Retired Professor, Author

Jan Conradi, Associate Professor, SUNY Fredonia

Dan Baur, Artist, Graphic Designer, Practitioner

Lynn Hendry, Artist, Practitioner

Adam Kwok, Professor

Karen Moyer, Associate Professor, Department of Design at Carnegie Mellon University

Mark Mentzer, Associate Professor, Department of Design at Carnegie Mellon University

Barbara Keough, Retired Art Teacher

Jil Eaton, MFA from Harvard, Practitioner

Glenn Miller. Associate Professor, Photographic Arts and Sciences,
Rochester Institute of Technology

Suzann Denny, Associate Professor, Coordinator of Foundations, SUNY Buffalo

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The following pages are a color lesson for first year graphic design college students. It was developed as part of a thesis project at Rochester Institute of Technology. It is an instructional tool called the Color Strategy Project. It will act as an introduction for teaching color strategies to graphic design students. Please review the material and fill out the Project Evaluation Form and mail it back in the self addressed stamped envelope at your earliest convenience. I would like to include your feedback in my thesis so I would appreciate a response by May 5, 2004 if possible.

Please include your name and any personal information you would like to share. I welcome any additional comments. Thank you very much for your help!

Sincerely,

Carol Fillip

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Color Strategy Project

Introduction

Color is a powerful tool and an important part of our visual experience. It is an element of design most people will instantly recognize in a communication. As designers, the color choices we make must go beyond our own preferences, mere visual appeal or the fact that a certain color(s) worked in another project. Color can help or hinder the transmission of a message and understanding it is a vital part of developing successful graphic design communications. For many designers, color can become intuitive, but how does one get to that stage?

Project

The Color Strategy Project is not a color course nor does it attempt to teach everything about color theory. Its purpose is to get you working actively in a meaningful situation in order to become more aware of color and make thoughtful decisions when using color.

This project is a set of structured short exercises revealing the rudiments of color as they pertain to graphic design. On computer, you will explore different color variables within the same composition(s) as you gain a hands on understanding of how color can affect the transmission of a message. The ability to follow written instructions will be a skill necessary when beginning professional careers as graphic designers so it is important to read and understand the exercises.

You are encouraged not to use the same colors for each exercise. Explore colors and combinations to identify differences. Remember, there are no absolutes with color and color is relative to what surrounds it. In addition to carefully choosing your colors, think about proximity, quantity, proportion and placement. Determine what impact your color choices have on the composition. Consider all possible solutions. Be prepared to explain your results!

Guidelines

You will need to use the color terminology provided to you (see attached) throughout the course of the exercises and critiques/discussions. It is encouraged to refer to colors by their name on the color wheel. For example, blue-green will be used instead of turquoise when we speak about that hue. You will use one or more of the templates (see attached) provided to you on disk to solve each exercise.

Objectives

- students will be better able to understand color interactions through the exercises
- students will be able to recognize how intelligent use of color can affect a graphic communication
- students will build a working color vocabulary
- students will discover how specific color combinations can better communicate specific messages
- students will be able to identify how color can be used to achieve specific outcomes (contrast, dimension, temperature, atmosphere, etc.)
- students will realize the importance of proximity, quantity, proportion and placement
- students will determine what impact their color choices have on the composition regarding meaning, function and form
- students will be able to solve more complex problems by using strategies in all design whether it is for 2- or 3-dimensional, print or web, static or motion situations

Exercise 1

Use template 1

- Choose 2 colors to generate the illusion of advancing to the foreground and/or receding to the background.

Repeat exercise with templates 3 and 4.

Exercise 2

Use template 2

- Choose colors to form a monochromatic scheme.

Repeat exercise with template 6.

Exercise 3

Use template 1

- Choose 1 color and make it appear to be 2 different colors. You may introduce additional colors, including black, white and shades of gray, to solve the problem.

Repeat exercise with template 2.

Exercise 4

Use template 4

- Choose 2 colors to solve the 3 part exercise. You may use tints and shades of your chosen colors to solve the problem.

1 produce vibration and movement
2 produce minimum contrast and dimension
3 produce maximum contrast and dimension

Repeat exercise with templates 5 and 6.

Exercise 5

Use template 5

- Choose any variety and number of hues to create a low key or a high key composition.

Repeat exercise with template 6.

Exercise 6

Use template 7

- Choose any variety of split complementary, analogous, or triad color combinations to complete the composition. Remember, it is encouraged that you choose colors you have not used yet.

Exercise 7

Use the above completed exercise.

- Substitute your chosen colors with neutral ones—black, white, and shades of gray—for this exercise.

Exercise 8

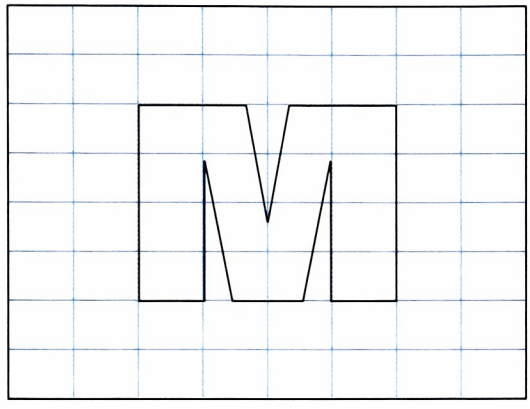
Use template 7

- Choose any variety of hues for the composition. Use nature, your surroundings or any non-graphic communication as your inspiration for your color choices.

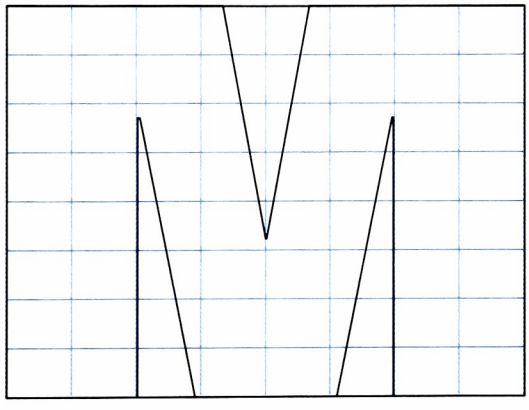
1 Bring in a picture of your inspiration to share with the class.
2 After you have completed this exercise, choose 1 word that best describes your color choices.
3 Bring your word and a typed definition to class with you and be prepared to explain your word.

Simple

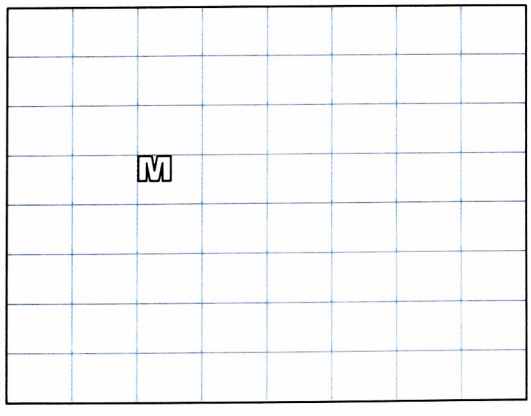
Template 1 – an equal size color-field



Template 2 – a large / small exaggerated color-field

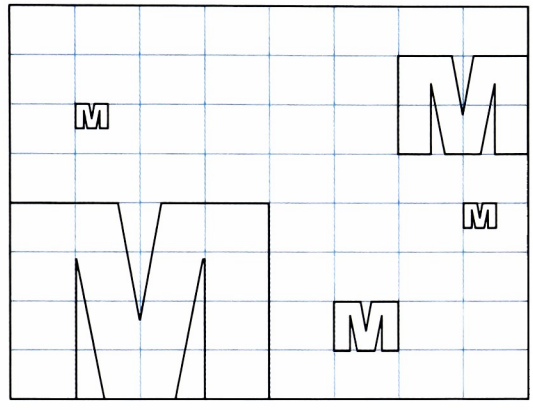


Template 3 – a small / large exaggerated color-field

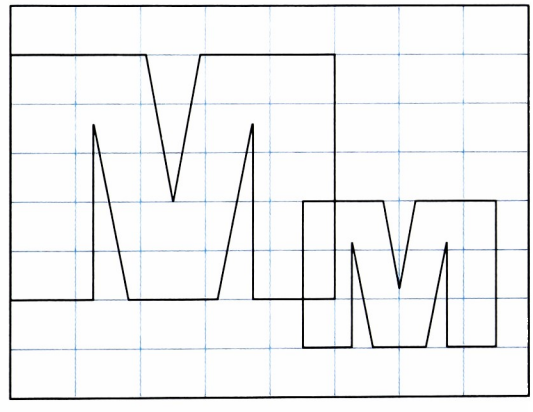


Intermediate

Template 4 – combination color-field composition

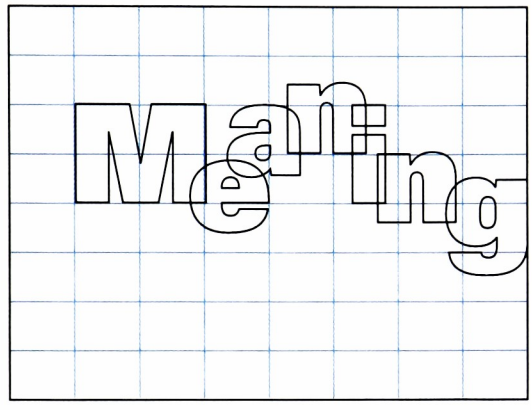


Template 5 – combination color-field composition with overlap of letterforms

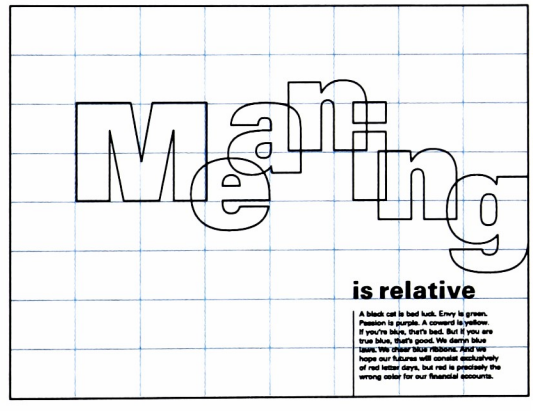


Complex

Template 6 – complex color-field composition with overlap of letterforms



Template 7 – complex and combination color-field composition with overlap of letterforms



Additive Colors	Colors made by lights which, when mixed, create white light (RGB).
After-image	The illusion of color and shape produced in the visual apparatus after staring at a strong color for some time. A positive after-image is the same color as the original; a negative after-image is its complement. See successive contrast.
Analogous	Neighboring colors on the color wheel–red-violet, violet, blue-violet. Colors that are closely related in hue(s). Broad use of analogous colors might encompass three or four adjacent hues with many variants in value.
Chroma	The purity of a color or its freedom from white, black or gray. The intensity of a hue.
CMYK Color	Printing technology uses a combination of Cyan, Magenta, Yellow, and Black (CMYK) inks that reflect and absorb various wavelengths of light. Colors created by the overprinting of these four colors are part of the CMYK color model.
Color Theory	The study of color; a set of statements or principles devised to explain color.
Color Wheel	A circular, two dimensional model showing color relationships, originating from Sir Isaac Newton's bending of the straight array of spectral hues into a circle.
Complementary Colors	Colors opposite each other on the color wheel: red and green, orange and blue, yellow and violet. When placed side by side they will intensify each other visually: when mixed as pigments they will dull each other.
Complementary Contrast	The juxtaposition of diametrically opposed colors on the chromatic circle. Such contrasts contribute to the fundamental and natural balance of chromatic composition.
Cool Colors	Colors from the blue and green side of the color wheel (greens, blues and violets). Cool colors generally recede and contract. See warm colors.
Diad	Using two colors that are two colors apart on the color wheel. For example, red and orange.
Double Complementary	A color combination in which hues adjacent to each other on the color wheel are used with their respective complementaries. See split complimentary.
High / Low Color Key	The overall brightness and chroma (color saturation). High key color is on the lighter end of the value scale. Low key color is on the darker end of the value scale. High and low key colors can have varying levels of color saturation. A composition in light values is termed a "high key", while one of dark values is called "low key". The image condition can be examined using the histogram or level compensation functions in image editing software.
High Key Composition	Compositions that are distinguished by their overall brightness, in which light predominates over dark.
Hue	This is the most characteristic dimension which identifies a color by name, ie red, yellow, blue, etc. Every color falls into a definite hue category when related to the spectrum range of colors.
Low Key Composition	Compositions that are distinguished by their overall darkness, in which dark predominates over light.

students will receive a complete list of terminology

Example of Exercise 4

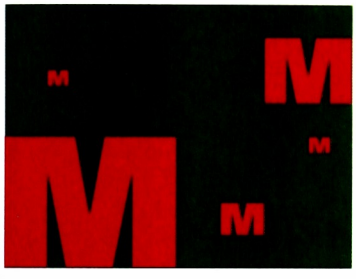
Use template 4

- Choose 2 colors to solve the 3 part exercise. You may use tints and shades of your chosen colors to solve the problem.

1 produce vibration and movement
2 produce minimum contrast and dimension
3 produce maximum contrast and dimension

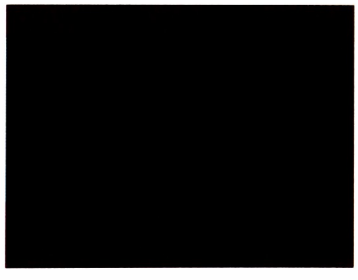
Repeat exercise with templates 5 and 6.

vibration and movement



minimum contrast and dimension

maximum contrast and dimension



Color issues discussed may include:

- Complementary colors tend to intensify each other visually when placed side by side. Colors repel one another and vibrate.
- Complementary colors are opposite each other on the color wheel.
- Complementary colors produce the greatest hue contrast especially when highly saturated.
- Using tints and shades of colors can dramatically change the way colors affect each other.
- When pigment complementary colors are mixed, in theory, they will dull each other.
- Professor will make connections to computer software students should be familiar with. For example, refer to the variations palette in Photoshop.

Color terminology used may include:

- Color wheel, complementary colors, complementary contrast, simultaneous contrast, after-image, value, depth, proximity, quantity, contrast of hue, contrast of saturation, intensity, tint, shade, distance, high or low key color etc.

Scale

5 excellent

4 good

3 average

2 deficient

1 failure

Project Development	exercises are appropriate as an introduction to help students understand color strategies	5	4	3	2	1
	format of exercise templates are a good vehicle for student exploration of color strategies	5	4	3	2	1
	exercises have the potential for encouraging students to explore a wide range of color combinations	5	4	3	2	1
	exploration of color through these exercises has the potential for stimulating student critical thinking	5	4	3	2	1
	using the computer in this project to explore with color strategies is appropriate	5	4	3	2	1
	project exercises and the critique / discussion following each completed exercise will provide a solid basis for student's active learning	5	4	3	2	1
Learning Objectives	students will be better able to understand color interactions through the exercises	5	4	3	2	1
	students will be able to recognize how intelligent use of color can affect a graphic communication	5	4	3	2	1
	students will build a working color vocabulary	5	4	3	2	1
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	students will be able to solve more complex problems by using strategies to all design whether it is for 2- or 3-dimensional, print or web, static or motion situations	5	4	3	2	1
	students will realize the importance of proximity, quantity, proportion and placement	5	4	3	2	1
	students will determine what impact their color choices have on the composition regarding function, form and meaning	5	4	3	2	1
	Overall Project	**5**	**4**	**3**	**2**	**1**

Name

use back for comments

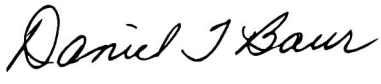
Review of Color Strategy Project:

Having thoroughly read through and exercised the Color Strategy Project developed by Carol for teaching, it is my belief she has zoned in on a specific subject matter that all students going into the visual arts need to identify with. Carol has developed a course for teaching the fundamentals in color theory and color relations that has gone beyond any previous programs that I am aware of. She did not go off into different tangents on the subject which could cause a student to loose insight of what this course is meant to convey.

My having completed several classes on color comprehension and color relationships was just one stepping block that has assisted me in my careers as a portrait artist, graphic artist and in computer graphics. The Color Strategy Project goes beyond and clarifies the importance color plays in today's world of visual arts.

I attended several classes at the Cleveland Institute of Art and studied for three years at Cooper School of Art. I later attended Maryland Institute of Art, where I graduated in 1976 cum laude.

Sincerely,
Daniel T. Baur



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INC #

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	Overall Project	(5)	**4**	**3**	**2**	**1**

GREAT!

Name JIL EATON · OWNER, AD, SMALL POND STUDIOS, INC.

use back for comments

Scale

5 excellent
4 good
3 average
2 deficient
1 failure

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Name Richard D. Zakia

use back for comments

Dear Carol 30 April 2004

Thank you for the opportunity to look over your "Color Strategy Project" I like the approach you are taking and the fact that it will be challenging and instructive to the learner.

May I offer a few suggestion for you to consider.

1. Under terminology, since you mention that RGB are additive colors why not mention that CMY are subtractive colors. Further, black is not one of the primary subtractive colors. As you know, it is added to enhance the contrast of the colors.

2. Complementary Colors. What you have is correct but you many want to go further and state that true complementary colors, when mixed, create a neutral color.

On page 8 with the color examples, I am sure the experience will be much more dramatic for the learner on the monitor or on a photographic grade paper.

You have an interesting project that I am sure can lead to further strategies and learning.

Richard D. Zakia

Richard D. Zakia

Carol, 30 April 04

Very well done. I wish you much success.

R. Zakia

Color Strategy Project

Project Evaluation

Scale

5 excellent

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	Overall Project	5 (4) 3 2 1

The color terminology needs a much longer description. It was difficult to follow the narrative. Maybe a page with a color wheel and appropriate key point words would help to orient the reader without an added explanation. But, I think the templates are a good idea. If you or campus lvl can talk about this.

Name S. Bowers

use back for comments